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ABSTRACT

Following its initial year, an engineered classroom for educationally handicapped (EH) children was replicated and extended. Evaluation indicated that the program could effectively increase emphasis on reading and include both primary and secondary students. Reintegration in the regular classes for EH children could be done on both a gradual and compulsory basis; the difficulty was in accurately assessing a given child's readiness for limited or total reintegration. The preacademic focus of the primary classes (ages 6 to 8) was validated in that a majority of subjects from the 1st year who had returned to regular classes were average or above in their functioning after 1 or 2 years in the program. Also EH children in the engineered classrooms outdistanced children in regular EH classes and approached or exceeded normal controls academically and behaviorally. Appendixes describe the engineered classroom and its dissemination and provide a behavior problem checklist and instructions for a frequency count of deviant behavior. (Author/JD)

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Final Report
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THE SANTA MONICA PROJECT

DEMONSTRATION AND EVALUATION OF AN ENGINEERED CLASSROOM DESIGN FOR EMOTIONALLY DISTURBED CHILDREN IN THE PUBLIC SCHOOL

PHASE TWO: PRIMARY AND SECONDARY LEVEL

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U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

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SUMMARY

The Santa Monica Project Phase One in 1966-67, evaluated the effectiveness of an Engineered Classroom design over a one year period with educationally handicapped children in the Santa Monica Unified School District in California. Phase Two of the Santa Monica Project 1967-69 was devoted to replicating, extending, and more critically evaluating the Engineered Classroom design.

Phase Two found that academic emphasis in reading could be increased in the Engineered Classroom with good results and that the program could include both primary and secondary students effectively. Re-integration in the regular classes for EH children can be done on both a gradual and compulsory basis and the difficulty is truly assessing a given child's readiness to be back in a regular room, at least for a limited period of time, demonstrated. The pre-academic focus of the Engineered Classroom has been validated in that a majority of Phase One returnees to the regular classroom were average or above average in their functioning after one or two years in the program. Finally, educationally handicapped children in the Engineered Classroom outdistance their EH counterparts in the regular classroom and approach or exceed normal controls both academically and behaviorally.

The Santa Monica Project, Phases One and Two, was selected as one of the top ten projects supported nationally by Title III to be presented at the Conference on Innovation in Special Education. It was further honored by being chosen as one of three projects to be presented by Dr. Warren J. Aaronson, Director, Title III program, Bureau of Education for the Handicapped, to the President's Advisory Board on Innovation and for documentation in the forthcoming Second Annual Report.

CHAPTER I

Introduction

Phase Two of the Santa Monica Project was undertaken during the 1967-1969 school years and was an extension of the demonstration and evaluation of an Engineered Classroom design based on a developmental strategy (Hewett, 1968) with emotionally disturbed children in the public schools reported earlier as Phase One in Final Report of Project No. 62893, December 1967, covering the 1966-1967 school year. A complete description of the developmental strategy and Engineered Classroom design, its operation, schedule, and curriculum appears in Appendix I.

Phase Two called for the utilization of the Engineered Classroom design with two primary classes (age 6-8) and two secondary classes (ages 12-15). Also, procedures were to be developed for the re-integration of students from the Engineered Classroom back into regular classrooms. In addition, the Santa Monica Unified School District agreed to continue the six Engineered Classrooms begun under Phase One of the project and to follow up on the progress of children who participated in the original study, during 1966-1968.

In actual practice it was decided not to isolate the primary classes as originally planned. Primary children were included in seven of nine multi-leveled (grade 2-6) Engineered Classrooms set up for the educationally handicapped students of the Santa Monica Unified School District.

The California State Department of Education does not classify children with serious attention, response, order, exploratory, social, or mastery problems as "emotionally disturbed" but rather uses the label "educationally handicapped" (EH). The children selected for all the project classes met the following requirements for inclusion in a state subsidized EH classroom:

> "Educationally handicapped minors, are minors, other than physically handicapped minors ... or mentally retarded minors ... who, by reason of marked learning or behavioral problems or a combinstion thereof, cannot receive the reasonable benefit of ordinary education facilities." (California Education Code, Section 6750)

From the total population of the nine Engineered Classrooms in Santa Monica during 1968-69 the investigators were able to form three matched groups for an evaluation study which included a total of ninety (90) children matched by I.Q., age, grade placement, and sex. These groups were; a) The Engineered Classroom group (N=30), consisting of educationally handicapped children in small classes of eight or nine students utilizing the Engineered Classroom design, b) Control Group I (N=30) consisting of educationally handicapped children enrolled in regular classroom with no more than two in any given room, and c) Control Group II (N=30) consisting of normal children functioning in regular classrooms.

Children in the Engineered Classroom Group and Control Group I all qualified as educationally handicapped children. They had been referred by elementary school principals throughout the District because of difficulties in adjusting to school and/or profiting from instruction. District school psychologists gave each child an individual intelligence test (Wechsler Intelligence Scale for Children) and all children included in the groups were functioning within the Full Scale I. Q. range of 85-120. (In addition to individual intelligence tests all children in the groups were given physical examinations and were found to be free from primary physically handicapping conditions.)

Further identification of the children in all three groups was accomplished by the "Behavior Problem Checklist" developed by Quay. The checklist groups children according to Conduct, Personality, Inadequate-Immature and Social Delinquent characteristics. The checklist is filled out by the child's classroom teacher and reflects the problem behavior the child exhibits in the room. The complete Behavior Problem Checklist appears in Appendix II.

Children in all three groups were also given achievement tests at the beginning and ending of the school year. The Reading Vocabulary, Reading Comprehension, and Arithmetic Fundamentals sections of the California Achievement Test (CAT), Elementary and Upper Primary Test was utilized to measure independent and silent reading ability and arithmetic computational skills.

A continuing behavior analysis was done on all students over a period of approximately 28 weeks. Two separate instruments were used in measuring behavior. One was the task attention measure used in Phase One of the Santa Monica Project. Task attention was defined as the time spent by a student maintaining eye contact with the task or assignment given him by the teacher. Observers operated stop watches during five minute samples and recorded the number of seconds the student's eyes (on in some cases, head or body) had been appropriately oriented toward the assigned task.

This task attention measure was augmented by a Classroom Behavior Rating developed by Werry & Quay which permits recording of Deviant Behavior, On Task Behavior, and Teacher Contact. Children were observed one at a time for twenty seconds and appropriate symbols relates to the above categories recorded on a score sheet. A sample of this score sheet and instructions are included in Appendix III. In the chapters which follow, Phase Two of the Santa Monica Project will be described in detail in terms of methods utilized and results found.

CHAPTER II

Methods

This chapter describes the procedures followed in Phase Two of the Santa Monica Project. The chapter will be organized around the six major goals of Phase Two which were as follows:

1. To continue the Engineered Classroom program developed during Phase One.

2. To extend the original work with the Engineered Classroom to the primary level.

3. To extend the use of the Engineered Classroom design to the secondary level.

4. To explore compulsory re-integration of the educationally handicapped child back into the regular classroom.

5. To follow up on progress made by the students in the Engineered Classroom during Phase One.

6. To compare academic and behavioral progress of educationally handicapped children enrolled in a regular class with those made by EH children in an Engineered Classroom and normal children functioning in a regular classroom.

The investigation was conducted entirely in the Santa Monica Unified School District which is located west of Los Angeles in the community of Santa Monica, California and which includes the coastal area of Malibu, some twenty-five miles to the North. The District serves approximately twenty-seven thousand children, adolescents and young adults from pre-school through junior college. The homes these individuals come from represent a broad range of socio-economic levels and groups at the two extremes are well represented. The socio-economic distribution of the school district is similar to that found in the greater Los Angeles County area and hence the Santa Monica Unified School District offers an ideal setting within which to conduct research.

A two week training program was conducted for all teachers who would be assigned to engineered classrooms in order to acquaint them with the developmental strategy and the Engineered Classroom design. Three of these teachers had participated in Phase One of the Project and proved to be valuable assistants in the daily series of lectures and demonstrations. The training program also included having each teacher play the part of the student, teacher, and aide in an Engineered Classroom and then spend one day as a teacher with regular students using Engineered Classroom techniques.

The Project Coordinator made daily visits to the classrooms throughout the year in order to maintain a consistency of method. The other investigators also made periodic visits to all classrooms and participated in the in-service training for all project teachers.

The remainder of this chapter will discuss each of the Phase Two objectives separated under the following headings; 1) Continuation of the original project, 2) Primary level, 3) Secondary level, 4) Compulsory Reintegration, 5) Follow-up Progress of Phase One, and 6) Matched Group comparison.

CONTINUATION OF THE ORIGINAL PROJECT

The Santa Monica Unified School District extended the original number of classrooms using the engineered design from six elementary classes in Phase One to nine elementary classes and two classes at a junior high school in Phase Two. One class was located at each of nine elementary schools. Each class was staffed by a teacher and a teacher's aide and no class contained more than nine students. A total of eighteen students participated in the secondary classes. Nineteen primary age students were included among the students in the elementary classrooms.

One of the major changes in the Phase Two continuation was the altering of the check-mark exchange system. Check marks were still given on a fixed interval basis with a possible ten check marks each 15 minutes, but the exchange for a completed Work Record Card varied. Students could exchange completed Work Record Cards for simple trinkets or candy (Stage 1), earned time activity card, (Stage 2) or a graphic or narrative report card (Stage 3). This exchange could take place as soon as the Work Record Card was completed rather than waiting until Friday as previously done. Earned time consisted of fifteen minutes of free time which the student could choose to spend at either the Communication, Exploratory or Order Center.

The check mark system attempts to provide rewards on a concrete, immediate basis for children who have not been responsive to the more typical kinds of rewards provided by school (e.g., long range grades, praise, parental recognition, competition, etc.). The teacher attempts to convey the idea that check marks are objective measures of accomplishment and literally part of a reality system in the classroom over which the teacher has little subjective control.

The continuation of the original project also provided an opportunity to change the emphasis of the Engineered Classroom to that of a helping class or a resource room, for each school. Transportation was eliminated for educationally handicapped children and former EH children reported to neighborhood schools since virtually every elementary school now had its own Engineered Classroom.

PRIMARY LEVEL

The fundamental goal of the Engineered Classroom is to get children paying attention, responding, following directions, exploring their environment and getting along with others before holding them for academic or intellectual performance. This is accomplished in a classroom set up with four major centers: 1) Mastery 2) Communication (Social) 3) Exploratory 4) Order (attention, response, order). Children are assigned tasks at each Center keeping within their individual educational problems and are awarded check-marks every fifteen minutes for behavior and work. Completed check-mark cards are exchanged for 1) tangible items 2) earned time or 3) a report card.

Primary children from Grades 2 and 3 were added to the Engineered Classroom during Phase Two. The children were included in multi-leveled elementary classes for the educationally handicapped (2-6 grades). Seven of the nine elementary classes maintained by the School District enrolled one or more primary students and nineteen children at Grades 2 and 3 were included overall in the on going Engineered Classroom.

The primary child was thought to be a natural for the Engineered Classroom. All children, especially primary children, need to learn how to pay attention, respond, follow directions, explore their environment, and get along with others. The educationally handicapped child at this level often has not learned acceptable classroom behavior.

The primary children were added to a multi-leveled class rather than placed in a separate classroom for several reasons. First, the basic philosophy of the Santa Monica Unified School District, Department of Special Services, does not call for transportation of Special Education students to Special Schools, if at all possible. Services for EH and educable mentally retarded (EMR) children are provided at every neighborhood elementary school. Thus, these classes become helping classes for that specific school and all children can walk to and from their homes to school. Secondly, the investigators reasoned that because the program was so highly individualized for each child anyway, the grade span (2-6) would not be a major factor. Larger, older children would not be subjected to group instruction with second graders or made to feel the class was really for "babies". The message in the Engineered Classroom has always been: "There are really nine separate classes in here, one for each student".

SECONDARY LEVEL

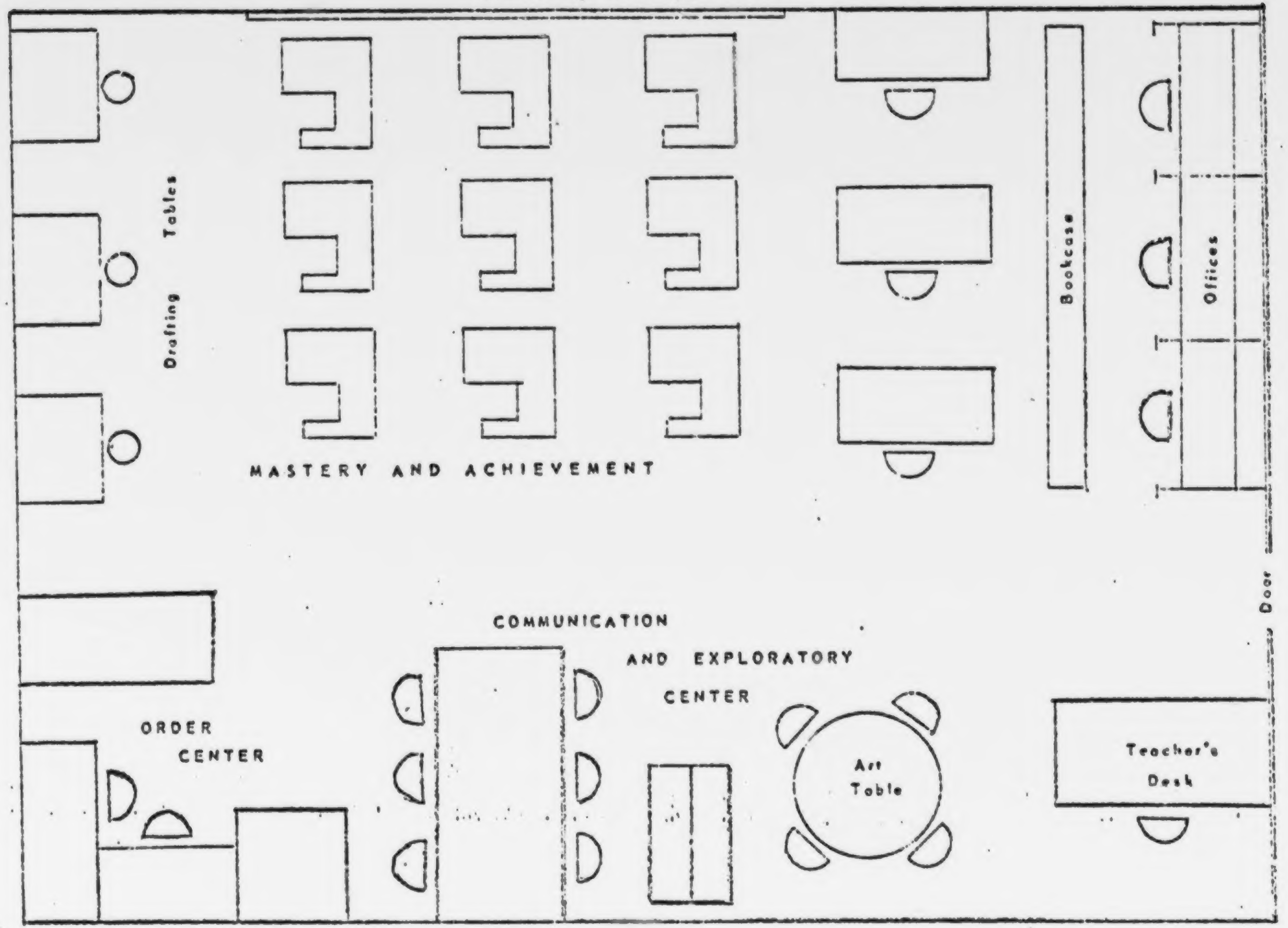
The Engineered Classroom concept was also extended to the secondary level. Two junior high school educationally handicapped classes (Grades 7-9) were created and found to be very effective after some alterations in room arrangement, curriculum, rescheduling, and check-mark systems were made. The physical arrangement of the classroom was set up as shown in Figure 1.

There are four mastery or academic work areas, an exploratory-art center, communication center, and order center as shown. Increased concern with academics was found necessary and desirable as the students at this level were generally functioning at a higher academic level than their elementary counterparts. They were also at a level in school where required courses for graduation and future school were expected. The student 'home base' in the room was the center arm chair area (Station One) where nine desks exactly like those used in all classrooms in the school were located. Around this area were three additional work areas: Station Two has three study carrels, with soft upholstered chairs and reference material such as a dictionary, telephone book, department store catalogue and an almanac were placed in each carrel. Station Three features three drafting tables with high stools to offer a marked shift in sitting and working position as well as setting. Station Four has three large double tables offering still another setting. The rational for selecting these centers or stations was that frequent moving to a different setting or working position appears to facilitate interest and concentration with this action-oriented adolescent group. During the day the teacher may rotate the entire class or only selected members through these work stations. The exploratory center (Station Five) stresses appropriate junior high science content and may have a stand-up work counter for another setting. The art (Station Six) and communication center (Station Seven) utilize many of the same types of tasks found effective with elementary age children and the order center (Station Eight) often contains a simple one-cylinder engine which can be dismantled piece by piece and reassembled, as well as automotive parts such as a carburetor. Puzzles and other direction following activities are also found here.

The curriculum in the junior high room has an additional hour for social studies along with reading, arithmetic, and exploratory periods. Most students spend at least part of the day in regular classes such as PE or shop and the junior high rotational class procedure facilitates early partial integration for these children. The check-mark system is similar to the one used in the elementary level class except that the cards are much smaller and designed to fit into a shirt pocket. Completed cards are exchanged almost exclusively in line with the Phase Two privilege time approach although increased use of the Phase Three (report card to be sent home) is being tried.

Figure 1

Engineered Classroom Plan for Junior High Educationally Handicapped Students


Drafting Tables
MASTERY AND ACHIEVEMENT
Bookcase
Offices
Door
COMMUNICATION AND EXPLORATORY CENTER
ORDER CENTER
Art Table
Teacher's Desk

COMPULSORY REINTEGRATION

A major concern of the investigation following completion of Phase One of the Santa Monica Project was reintegration of project students back into regular classrooms following their assignment to the Engineered Classroom. Once a student has shown behavioral and academic progress in a special class setting, how could you place him in a regular class either full time or with continued partial support from the Engineered Classroom as a resource room? The main problem encountered seemed to revolve around finding regular class teachers who were willing to include a child with a previous history of serious school problems in their program when many of them already had a number of difficult children with whom they had to cope. In an effort to deal with this problem and explore a unique policy of integration, the Santa Monica Schools attempted a program of compulsory reintegration during the 1968-69 school year.

What if it were District policy to re-assign every elementary age educationally handicapped child on a compulsory basis to a regular classroom for Fall 1968-1969? There would be no individual case conferences, screening, or evaluating of children although the school psychologist and school principal would use the same procedures used with all children in matching a child with a particular regular class or teacher. Thus, in the fall there would be no immediate placement of students in special classes. The teachers of these classes would set up their rooms during the first two weeks of school and wait for those children who were having difficulty in the regular class to be referred back into a special program.

The risks of such an approach were obvious: 1) What about the child who was far from ready behaviorally or academically? Won't you merely expose him to another failure experience? 2) Without detailed attention to matching regular class and teacher to returning special child the likelihood of successful reintegration would surely diminish.

But in addition to such risks there were also obvious advantages: 1) As District policy it would be presented to all regular classroom teachers as an impartial, administrative decision. No teacher was being singled out; educationally handicapped children were being returned to the classes they likely would have been in if special classes were non-existant in the District. 2) This compulsory re-assignment would not be presented as an end in itself. The special classes were not being disbanded. Regular classroom teachers were being asked to participate in a yearly re-assessment of all educationally handicapped pupils. The special classes were available for referral if and when any child could not function in a regular room. 3) Rather than having to seek out regular teachers on a one-to-one basis and sell them the idea of re-assigning a special child to their class, the tables, as it were, would be turned. The regular teacher would be asking the special class teacher to work with the child either part or all of the day. 4) The child's seat in the regular classroom would be saved for him. His 'home base' classroom would be established and when he was ready for reintegration, either partially or entirely, his specific placement would be obvious. What about selling the regular teacher on having him back? No problem! The child's desk is waiting and in addition didn't we help the regular teacher out in the first place by providing special help for a problem pupil assigned to her room? 5) With this approach some children who matured over the summer, had some dramatic positive change occur in their home environment which improved their general behavioral functioning and attitude toward school would be given a chance to move right along in their regular grade. This might not be expected to happen to many children but who is really to say, and to know exactly when a child with learning problems might better be placed in a regular program? The compulsory re-assignment procedure would provide a yearly opportunity for re-assessment not merely through somewhat artificial behavioral sampling, ala a psychologist's evaluation, but in a real world classroom situation.

As a result of the compulsory reintegration policy set up by the Santa Monica Schools, all seventy of the 1967-68 educationally handicapped children at the elementary level (Grades 4-6) were re-assigned to regular classes at the beginning of the 1968-69 school year. The seventy children had been in special classes with nine students, a teacher, and an aide, and a highly individualized and reinforcing learning environment. Fourteen have been in these classes for two years, the remainder for one year.

The Santa Monica Office of Special Services designed a simple questionaire which was sent to all of the schools in which these children were now enrolled. The questionaire was sent attached to a cover letter signed by the Director of Special Services and asked for the following information:

1. Evaluation of Academic Program (Report on achievement in subject matter areas, including comments on any unique or continuing learning problem.)

2. Evaluation of Progress in Behavior (Report on pupil behavior in the classroom and playground, including relationships with classmates and, if possible, other school children.

Once the questionaires were returned the Santa Monica School Psychologists rated both academic and behavioral statements according to five point scales.

Academic Scale

1 - Markedly above grade level
2 - Above grade level
3 - At grade level
4 - Below grade level
5 - Markedly below grade level

Behavioral Scale

1 - Outstanding
2 - Above average
3 - Average
4 - Below average
5 - Poor

The mid-point of the behavior rating scale was seen as representing a level of behavior which results in generally positive reinforcement on the part of the classroom teacher. The psychologists first made independent rating of the follow-up statements and then met to discuss discrepant ratings which were then adjusted to single ratings. The findings of this compulsory reintegration approach will be presented in the next chapter.

FOLLOW-UP PROGRESS OF PHASE ONE

There were fifty-four children (ages 8.0 to 11.11 years) actually enrolled in the six project classrooms (nine in each) during Phase One at the close of the year 1966-67, however, complete data was only available on forty-five. Questions of concern in the follow-up study were, 1) Where are these original forty-five students who were diagnosed by an Admissions team of a psychologist, physician, classroom teacher and school principal as "educationally handicapped" in 1966? 2) How many years did they spend in the Engineered Classroom? 3) Of those now placed in regular classrooms, how are they performing academically and behaviorally in relation to a regular classroom?

Of the original forty-five children, thirty-seven were located and follow-up information obtained. The other eight had moved out of the school district or the state and could not be traced. Only two of the thirty-seven students were still enrolled in the Engineered Classroom program for educationally handicapped children in Santa Monica. The remaining thirty-five were in regular classrooms. Of these thirty-five, twenty-four had remained in the program for one year, eleven for two years. Referral back to a regular classroom had been made when the teacher in the educationally handicapped program felt the child was first behaviorly in a position to be successful in regular class and second, academically qualified to function within the range of academic levels to be found in the regular classroom.

With reference to the final question of academic and behavioral functioning at present, questionnaires were sent to the thirty-seven children's teachers (including the two children still in a special class). The questionnaires were sent out with a cover letter signed by the Director of Special Services requesting information regarding "Evaluation of Academic Progress - report on achievement in subject matter areas, including comments on any unique or continuing learning problems" and "Evaluation of Progress in Behavior - report on pupil behavior in the classroom and playground, including relationships with classmates and, if possible, other school children." Under these two general headings the teachers were expected to write descriptive statements. These statements were later reviewed by a team of school psychologists who rated them in terms of 'academic functions' and 'behavior', using the five point scale described in the Reintegration Section.

A summary of the findings of this follow-up appear in the chapter on findings in this report.

MATCHED GROUP COMPARISONS

Following Phase One, the investigators decided that it would be useful to compare the behavioral and academic functioning and progress of EH children in the Engineered Classroom with a group of identified EH children assigned to regular classroom and a group of normal children of similar I. Q., chronological age and sex. To provide this comparison, three matched groups were formed. The Engineered Classroom Group consisted of thirty EH children in the Santa Monica Engineered Classroom program during 1968-69. Control Group I consisted of thirty EH children matched with the Engineered Classroom group by I. Q., age and sex and Control Group II was made up of thirty normal children, selected at random by regular classroom teachers or "average students" with few, if any, academic or behavior problems. This latter group was also matched on the I. Q. - age - sex criteria.

What emerged were thirty matched triplets, each triplet containing one Engineered Classroom student, one EH student in a regular class and one normal child. These thirty triplets are presented in Table 1.

Control Group I was drawn from regular Santa Monica elementary classrooms and no more than two such Control students came from the same class. In addition, no more than five Control Group I students came from the same school. Control Group II students were drawn from the same schools as Control Group I and, in some cases, from the same classes.

All three groups were given the California Achievement Test, Reading Vocabulary, Teading Comprehension and Arithmetic Fundamentals section in October, 1968 and again (with alternate forms) in May, 1969. For thirty-two weeks during the school year behavioral data was gathered on all students using the Phase One Task Attention measure and the Classroom Behavior Rating procedure developed by Quay. The latter measure provided a measure of 'On Task' behavior comparable to the Phase One Task Attention and frequency counts of deviant behavior in the following categories: out of seat, physical contact, noise, turning and vocalization. In addition, a frequency count of positive and negative contact between teacher and child was founded.

All ninety children were also rated on the Classroom Problem Behavior Checklist developed by Quay. The results of this matched group comparison are presented in the next chapter.

TABLE 1

Matching of Engineered Class, EH in Regular Class and Normal Students.

Student	ENGINEERED CLASS GROUP				CONTROL GROUP I-(EH)				CONTROL GROUP II (Normal)			
	I.Q.	Age	Grade	Sex	I.Q.	Age	Grade	Sex	I.Q.	Age	Grade	Sex
1	112	11	6	M	110	10	6	M	112	11	6	M
2	89	12	5	M	93	11	5	M	98	11	5	M
3	108	11	6	M	112	11	6	M	111	10	5	M
4	103	10	5	F	110	9	4	F	110	10	5	F
5	112	10	5	M	110	10	5	M	115	10	5	M
6	86	10	5	M	86	10	5	M	88	10	5	M
7	107	7	3	M	102	7	3	M	108	7	3	M
8	91	9	3	M	98	8	3	M	99	9	3	M
9	102	11	6	M	96	11	5	M	105	11	5	M
10	93	10	6	M	91	11	6	M	95	10	5	M
11	100	9	4	M	105	9	4	M	110	9	4	M
12	105	10	5	M	107	10	5	M	109	10	5	M
13	85	10	5	M	85	11	5	M	90	10	5	M
14	85	8	3	M	86	8	3	M	88	8	3	M
15	107	8	3	M	105	8	3	M	110	8	3	M
16	120	10	5	F	110	10	5	F	120	10	5	F
17	89	10	4	F	104	10	4	F	101	10	5	F
18	110	9	4	M	140	9	5	M	120	9	4	M
19	100	10	4	M	96	10	5	M	110	10	5	M
20	94	9	4	M	83	9	4	M	100	10	5	M
21	92	10	4	M	85	9	4	M	100	9	4	M
22	113	11	5	M	111	10	5	M	100	10	5	M
23	84	11	5	M	80	10	5	M	85	10	5	M
24	97	8	3	F	93	8	3	F	102	8	2	F
25	98	7	3	F	96	8	3	F	100	8	3	F
26	85	10	5	M	99	11	5	M	99	10	5	M
27	98	10	5	M	98	10	5	M	99	10	5	M
28	92	9	4	F	86	9	5	F	102	8	3	F
29	96	10	5	F	90	10	5	F	104	10	5	F
30	87	10	4	M	85	10	4	M	96	9	4	M

CHAPTER III

Results

The Phase Two evaluation data will be discussed in the same order as that presented in Chapter II.

CONTINUATION OF THE ORIGINAL PROJECT

During 1968-69, the Santa Monica Schools conducted nine Engineered Classrooms in elementary schools in the District. This was an increase of three over the Phase One period, 1966-67. The Phase Two program was evaluated in all nine classrooms with a pre and post California Achievement Test (CAT) as was the Phase One program. Behavioral data was also taken for all children in Phase Two but will be restricted to the report on the thirty matched triplets presented later in this chapter.

During Phase One, the Total Reading and Arithmetic Fundamentals scores over the year are reported in Table 2. Since only one of the Phase One classes maintained the Engineered Classroom design for the entire year, it is presented for comparison with the total Phase One program with an N of 7.

TABLE 2

Pre and Post CAT Means for Total Reading and Arithmetic Fundamentals during Phase One.

N=7	Pre-Test Mean	Post Test Mean	Mean Gain
Total Reading	3.2	3.6	.4 year
Arithmetic Fundamentals	3.9	5.1	1.2 year

Phase Two achievement scores are presented in Table 3. Since the entire elementary age population of the 1968-69 Engineered Classroom program were maintained in the design for the entire year, the N here is 74.

TABLE 3

Pre and Post CAT Means for Total Reading and Arithmetic Fundamentals during Phase Two.

N=74	Pre-Test Mean	Post Test Mean	Mean Gain
Total Reading	2.9	3.7	.8 year
Arithmetic Fundamentals	3.4	4.4	1.0 year

As can be seen, the Phase Two gain in reading was twice that achieved during Phase One (.8 gain vs. .4 year) although the limited Phase One sample makes such a comparison uncertain. However, during Phase Two, a definite attempt was made to increase the emphasis on reading by means of the following:

1. The introduction of programmed and spaced reading materials. (S. R. A., Sullivan, Grolier)

2. A wider range of reinforcement for individual reading effort including a candy for each line read correctly, a reading check-mark card redeemable for fifteen minutes of free time plus a bar graph to record lines read correctly.

3. Increased teacher competency through experience and in-service training.

4. The use of Phono-Visual materials.

Arithmetic gains were comparable for both Phase One and Two groups. An interesting comparison of Phase Two achievement gain will be presented in the context of the Matched Group Comparison in a later section.

PRIMARY LEVEL

As was stated in Chapter Two, nineteen children in grades two and three were added to the elementary Engineered Classroom program during 1968-69, resulting in a grade span of grades two to six. When separated out from the total elementary group presented in the last section, the nineteen primary children obtained schievement scores as shown in Table 4.

TABLE 4

Pre and Post CAT Means for Total Reading and Arithmetic Fundamentals during Phase Two for Primary Age Children in the Engineered Classroom Program.

N=19	Pre-Test Mean	Post Test Mean	Mean Gain
Total Reading	1.7	2.5	.8 year
Arithmetic Fundamentals	2.1	3.3	1.2 year

The achievement gains for the primary group are almost identical with those of the total elementary age population in the Phase Two Engineered Classroom Program presented in the last section. It would appear, therefore, that the introduction of a younger age group into the program had no detrimental effect on the reading and arithmetic achievement of the older students and that the younger group made good progress academically.

With respect to Task Attention and On Task Behavior, the primary students averaged 84% and 82% respectively during a twenty-six week period of observation in 1968-69. How this compares with the matched groups will be discussed in a later section.

SECONDARY LEVEL

While it was planned to present an achievement test comparison between eighteen educationally handicapped junior high school students (15 boys and 3 girls) enrolled in the adaptation of the Engineered Classroom design discussed in the last Chapter, EH students left in regular classroom and normal junior high school students, an uncontrolled and invalid post test administration makes this impossible. However, Task Attention and On Task behavior measures were taken of these three groups over a twenty-six week period during 1968-69 and appear in Table 5. Students were matched as much as possible by age, sex, I. Q., and grade placement.

TABLE 5

Task Attention and On Task Behavior Percentage Mean for EH Engineered Classroom Students, (N=18) Control I, EH Students in Regular Classroom (N=5) and Control II or Normal Students in Junior High (N=5).

	EH Eng. Class.	Control I EH Reg. Class.	Control II Normal Students
Task Attention	88%	64%	88%
On Task Behavior	82%	67%	84%

Here we see that the attention of the EH Engineered Classroom group is practically identical with that of normal students and considerably superior to the attention manifested by EH students remaining in regular classroom. The fact that these latter students functioned at a lower attention level than their elementary counterparts, who participated in the matched group comparison (data to be presented later) offers evidence regarding the deteriorating effect of a prolonged lack of success in the school environment.

COMPULSORY REINTEGRATION

As described in Chapter II, seventy children enrolled in elementary Engineered Classrooms in Santa Monica during 1967-68 were re-assigned on a compulsory basis to regular classrooms beginning fall, 1968. Fourteen of these students had been in these classes for two years, the remainder for one year. In the fall an inventory of these original seventy pupils revealed: 1) One of the pupils had died as the result of chronic health problems which had existed for his entire life, 2) Eighteen had moved out of the Santa Monica District. This number represented 25% of the original group and is somewhat higher than what might be expected in a typical elementary school population turnover, 3) Twenty-six of the seventy children were referred back within the first two weeks by the regular teacher to whom they had been assigned, on the basis of behavior problems or serious academic deficits which were not viewed as amenable to remediation in the regular class. This number constitutes 37% of the original seventy.

The remainder, a surprising twenty-five children, or 36% of the original group were never referred to either the Santa Monica Office of

Special Services or individual principals for re-assignment to special classes. Therefore, about as many children were maintained as referred back to the special program. This number increases in favor of children maintained in regular class when placement of ten of the eighteen children who had moved is considered. These ten children were the only ones possible to trace and all had been assigned to a regular class in the new school district. Therefore, 50% of the original sample were functioning in regular class at mid-year 1968-69.

It is to the forty-three children who either moved and were assigned a regular class or remained non-referred in Santa Monica classes that we turn. Follow-up data was gathered on ten of the eighteen children who had moved and the twenty-five pupils maintained in Santa Monica. Thus, the number of regular class returnees for whom we have follow-up data becomes thirty-five. We might further define the characteristics of these thirty-five children by means of the following:

1. Eleven of the children had spent one to two years in the special classroom in Santa Monica.

2. The remaining twenty-four had spent only one year or less in a special class.

The follow-up rating procedure described in Chapter II was used by the regular class teacher to report on the student's functioning level. The follow-up data gathered on the thirty-five returnees who were maintained in regular school appear in Tables 6 and 7. Table 6 presents data on the twenty-four returnees who had been in the Santa Monica program for the educationally handicapped for one year prior to re-assignment. Table 7 presents similar data for the eleven returnees who were re-assigned after two years in the program.

As can be seen, less than one-third of the one year returnees were rated as functioning at grade level or above in their regular classes. Sixty percent, however, were rated as average or above in terms of classroom behavior. For the two year returnees all were rated below grade level academically, yet 81% were seen as average or above in behavior. The proportion of students below grade level was much greater among those entering junior high school for the first time than it was for students continuing on at the elementary level. This is understandable when the more limited range of individual academic differences found in secondary level classes is compared with that found at the elementary level is considered. In addition, the single class placement of the elementary child presents more opportunities for individualization of instruction than does the class rotational structure of junior high school. Nevertheless, the fact remains that academic deficiencies were pronounced among those children who were not referred back to special classes. Implications here are that children far below

TABLE 6

Academic and Behavioral Functioning of Twenty-four Students Enrolled in Santa Monica Special Classes for One Year or Less Who Were Returned to Regular Classroom as a Part of Compulsory Reassignment and Not Referred Back to Special Classes.

	Placement			
	Regular S.M. Elem. class N = 11	Outside Reg. Elem. class N = 6	Reg. S.M.Jr. High classes N = 6	Outside Jr. High classes N = 1
Academic				
Markedly above GL				
Above GL	2			
At GL	3	1	1	1
Below GL	5	4	3	
Markedly below GL	1	1	2	
Behavior				
Outstanding	1		1	
Above average	2	2		
Average	4	2	2	1
Below average	3	1	1	
Poor	1	1	2	

8/25 at or above grade level academically (32%)
15/25 average or above behaviorally (60%)

TABLE 7

Academic and Behavioral Functioning of Eleven Students Enrolled in Santa Monica Special Classes for One to Two Years Who Were Returned to Regular Classroom as a Part of Compulsory Reassignment and Not Referred Back to Special Classes.

	Placement			
	Regular S.M. Elem. class N = 2	Outside Reg. Elem. class N = 2	Reg. S.M.Jr. High classes N = 6	Outside Jr. High classes N = 1
Academic				
Markedly above GL				
Above GL				
At GL				
Below GL	2	1	5	1
Markedly below GL		1	1	
Behavior				
Outstanding		1		
Above average	2		2	1
Average			3	
Below average		1	1	

0/11 at or above grade level academically (0%)

9/11 average or above behaviorally (81%)

grade level may need to be picked up and given special remedial instruction, perhaps on a part time basis. These children may not need a total self-contained approach as suggested by the percentage viewed as average or above in terms of behavior. In this regard it is interesting to note that the ratings of behavior for the two year returnees (two years in special classes before being re-assigned) 81%, was higher than those for one year returnees, 60%. Statistics presented here in percentage form must necessarily be suspect as accurate and meaningful data due to the small sample size and the disproportunate effect of one or two ratings on the general picture, but at least there is a suggestion that those staying in the special classes for two years profited in terms of school behavioral adjustment and possibly attitude.

Some interesting additional data was provided by comparing recommendations made by the teachers of the educationally handicapped classes with respect to Fall placement for their pupils with the results of the compulsory re-assignment procedure. In the Spring of 1967-68 these teachers were asked to specify either a 'continuing special class' or 'return to regular class' recommendation for each child. Twenty-three of the thirty-five non-returnees had been so evaluated prior to compulsory re-assignment. Nine of them were entering junior high in the Fall and fourteen were remaining in elementary school. The results of the special class teacher recommendation and eventual academic and behavioral ratings given the non-returnees is as follows:

1. Fourteen of the twenty-three non-returnees had been recommended for regular class placement. Seven of these were destined for junior high school.

    a) 13% of these students were later rated by regular class teachers as functioning at grade level or above academically.

    b) 71% of these students were later rated as functioning at average or better level in terms of behavior.

2. Nine of the twenty-three non-returnees had been recommended for continued special class placement. Two of these were headed for junior high.

    a) 33% were later rated by regular teachers as functioning at or above grade level.

    b) 66% were seen by these teachers as average or better in classroom behavior.

Thus, over one-third of these students seen as needing continued special class placement by previous special teachers were being maintained in regular classes although the majority of them were below grade level academically. Their behavior was similar in over-all rating for the entire follow-up sample. Interestingly, the fourteen children seen as ready for regular class placement were doing considerably less well academically than those seen as non-ready (13% vs 33%) although this probably is a reflection of the fact that seven were going to junior high and the special class teacher may have seen a regular class placement as logical at the point in the child's education. The fact that academic demands at the junior high level are considerable has been mentioned earlier.

Another interesting comparison can be made between the 1967-68 special class teacher's recommendations and status of those twenty-six children who were referred back to special classes after two weeks in regular classes. Twenty-four of these twenty-six had been previously evaluated by their special class teachers with the following results:

1. Eight of these twenty-four students were recommended for placement in regular classes although four of these recommendations were tentative.

2. Sixteen of the twenty-four were definitely seen as candidates for return to the special classroom.

Here one third (eight out of twenty-four) of those seen as ready or almost ready for return failed to make it in regular classes while the previous data indicated about one-third (nine out of twenty-three) of those seen as candidates for return to special classes were being maintained in regular classes. From the admittedly limited validity of this study, it might be speculated that teacher recommendations alone, as a basis for reassignment of an educationally handicapped child to a regular classroom might be subject to question one-third of the time.

PROGRESS OF PHASE ONE

Follow-Up

Although fifty-four children had participated in the Phase One project during 1966-67, only thirty-seven were located at the time of the follow-up study during Phase Two. Two of these children were still assigned to Engineered Classroom in the Santa Monica District, the other thirty-five were in regular classrooms both in the District and elsewhere in California and the United States. The evaluation procedure described in Chapter II was followed by the regular and special class teachers working with these thirty-seven children and Santa Monica District psychologists rated the evaluation in both behavioral and academic areas. Table 8 reports the results of these ratings.

TABLE 8

Academic Performance and Student Behavior Ratings for the thirty-seven Santa Monica Project Students.

Located During Phase II in 1968-1969

Academic Performance Rating	N	%	Student Behavior Rating	N	%
1. Markedly above grade level	0	0	1. Outstanding	2	5
2. Above grade level	1	3	2. Above average	16	43
3. Grade level	11	30	3. Average	8	22
4. Below grade level	15	40	4. Below average	10	27
5. Markedly below grade level	10	27	5. Poor	1	3
	37			37	

As can be seen, one-third of the students are seen as at or above grade level academically, 40% are below grade level while 27% are markedly below grade level. Seventy percent, however, are seen as functioning from 'average' to outstanding in behavior with 27% below average and 3% as poor. An examination of these data in relation to enrollment in experimental or control status in the original project does not reveal any sizeable difference in length of time spent in program or academic or behavioral status at present.

MATCHED GROUP COMPARISON

As described in Chapter II, thirty triplets matching EH children assigned to the Engineered Classroom during 1968-69 with identified EH children remaining in regular classroom and normal children were set up so that comparisons might be made of both behavioral and academic functioning over the year. These matchings were presented in Chapter II, Table 1.

In addition, the Behavior Problem Checklist was filled out for all ninety children so that a comparison might be made mutually of the types of behavior problems represented in the three groups. Table 9 reports the mean scores for each group in the four descriptive categories covered by the checklist: conduct problem, personality problem, inadequate-immature problem, and social delinquent problem. The EH children in both the Engineered Classroom and regular classroom demonstrated a preponderance of conduct problems. They also reflected more problems in all of the other categories than the children considered normal, which is as would be expected. It is interesting to note that the mean scores for the EH children in both settings were very similar for the conduct, personality, and inadequate-immature categories. Therefore, it can be stated with some certainty that differences in the over-all behavioral complexion of the two EH groups did not contribute to differences in behavioral or academic functioning over the year.

The Behavior Problem Checklist ratings for the EH children was also compared with academic growth. A student was deemed to be a conduct problem if he received a score of nine or higher in that category on the checklist. The same procedure was used for personality problems but a score of eight or higher was selected as qualifying the student. If a child clearly manifested a combination of two or more problems he was not included in this behavioral-academic functioning comparison. Table 10 compares the EH children rated as conduct or personality problem in relation to academic growth.

TABLE 9

Mean Scores for EH Engineered Classroom, EH Control I and Normal Control II Students on the Behavior Problem Checklist (after Quay).

Problem	Engineered Group Classroom Class N=30	Control I (EH) in reg. class N=30	Control II (Normal) N=30
Conduct	9.59	8.79	2.75
Personality	5.63	5.28	1.46
Inadequate Immature	3.76	3.62	.82
Social Delinquent	1.04	.48	.21

TABLE 10

Behavior Problem Checklist Ratings and Academic Gain Comparisons between EH Engineered Classroom and EH Control Group I Students Rated as Either Conduct or Personality Problem.

		Reading Vocabulary			Reading Comprehension			Arithmetic Fundamentals		
		Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain
Conduct Problem	Engineered Class N=11	3.43	3.99	.56	2.86	3.56	.70	3.49	4.47	.98
	Control I N=11	3.74	3.98	.24	3.30	3.86	.56	3.60	4.22	.61
Personality Problem	Engineered Class N=4	4.28	4.98	.70	3.93	4.90	.97	3.90	4.68	.98
	Control I Class N=8	3.88	4.16	.28	3.33	4.19	.86	4.06	4.66	.60

As can be seen, EH Engineered Classroom students rated as personality problems gained more growth in reading (reading vocabulary .70 year, reading comprehension .97 year) than students in the same setting reading comprehension .70 year. EH Control Group I students, although below their Engineered Classroom counterparts in general academically, followed the same trend.

Table 11 reports a Behavior Problem Checklist and academic comparison for EH children in both groups who were rated along the mean score for their group in both conduct and personality categories. The gains made by these multi-problem students were in general similar to those made by students falling into specific categories in all but reading comprehension where the multi-level EH Engineered Classroom group was only .56 year. However, the limited N makes speculation about actual academic gain differences between these differentially rated children uncertain.

TABLE 11

Behavior Problem Checklist Rating and Academic Gain Comparison between EH Engineered Classroom and EH Control Group I Students Rated as Both Conduct and Personality Problems.

CAT	Reading Vocabulary			Reading Comprehension			Arithmetic Fundamentals		
	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain
Engineered Class N=6	3.5	4.1	.6	2.8	4.0	1.2	3.5	4.6	1.1
Control I Class N=6	4.8	4.7	.1	4.5	5.0	.5	4.8	5.4	.6

The thirty matched triplets were also evaluated according to achievement test gains, Task Attention and On Task behavior and seven deviate behavior categories from the Classroom Problem Behavior Rating procedure as described in Chapter II. For the achievement, Attention and On Task evaluation, a thorough statistical analysis was performed with significance accepted if differences were beyond the .05 level of confidence. Each of the achievement areas (reading vocabulary, reading comprehension, arithmetic fundamentals), the Task Attention and On Task behavior and the denoted behavior categories will be discussed in turn.

Table 12 presents the Analysis of Covariance Means and t-Test for reading vocabulary. The means for both pre and post tests are presented along with the adjusted mean desired at through the covariance technique. This mean is an adjusted post test mean reflecting differences between groups on the pre test. The significant F (beyond .05) reveals the existence of actual differences between the mean reading vocabulary scores for the three groups over the year, and the t test evaluation demonstrates the following:

1. The Engineered Classroom group gained significantly more in reading vocabulary than Control Group I.

2. Control Group II also gained more than Control Group I but did not differ significantly from the Engineered Classroom group.

Therefore, we may assume that the progress in reading vocabulary was similar for both EH children in the Engineered Classroom and their normal counterparts and that both groups made better gains than Control Group I.

Table 13 reports the Analysis of Covariance data for all groups in reading comprehension. The F score is not significant, therefore no significant differences between groups can be assumed. However, the adjusted means of the Engineered Classroom group and Control Group II differ from each other by only .05 years while each of them differ from Control Group I by .2 years. The trends found in the reading vocabulary measures, while not significant, is clearly present here.

Table 14 contains Analysis of Covariance data for all groups with respect to arithmetic fundamentals. The F score here is significant beyond the .01 level of confidence and the subsequent t test evaluation reveals the following:

1. The Engineered Classroom group made significant gains in arithmetic fundamentals over both Control groups I and II.

2. Control groups I and II do not differ significantly with respect to arithmetic fundamentals.

Therefore, the EH Engineered Classroom group demonstrated superior progress to both EH children in the regular classroom and normal children. This is particularly striking in relation to the normal and is probably accounted for by the lower pre test mean for the Engineered Classroom group.

In evaluating the Task Attention and On Task behavior, seven four week intervals were utilized. The data is based on a comparison of the first Task Attention and On Task behavior measure for each subject with the final measure, taken in general some seven weeks later.

TABLE 12

ANALYSIS OF COVARIANCE, MEANS AND t-TESTS FOR READING VOCABULARY

ANOVA

Source	S S	d f	Mean Square
Treatments	3.27	2	1.63
I. D.	43.96	86	.51
Total	47.23	88	

$F_{2,\,86} = 3.20$ Sig. .05

MEANS

Group	Pre-Test Mean	Post-Test Mean	Adjusted Mean
1. EH Control I	4.21	4.27	4.41
2. EH Engineered	3.48	4.03	4.82
3. Normal Control II	5.39	5.73	4.80

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t-TESTS

t-Tests	Sig.
$t_{1,2} = 2.25$	.05
$t_{1,3} = 2.14$	.05
$t_{2,3} = .1099$	N. S.

TABLE 13

ANAYLSIS OF COVARIANCE, MEANS AND t-TESTS FOR READING COMPREHENSION

ANOVA

Source	S S	d f	Mean Square
Treatments	.93	2	.46
I. D.	85.44	86	.99
Total	86.37	88	

$F_{2,86} = .47$ N. S.

MEANS

Group	Pre-Test Mean	Post-Test Mean	Adjusted Mean
1. EH Control I	3.64	4.14	4.31
2. EH Engineered	3.02	3.82	4.50
3. Normal Control II	4.89	5.40	4.55

TABLE 14

ANALYSIS OF COVARIANCE, MEANS AND t-TESTS FOR ARITHMETIC FUNDAMENTALS

ANOVA

Source	S S	d f	Mean Square
Treatments	3.9335	2	1.9667
I. D.	29.1691	85	.3432
Total	33.1026	87	

$F_{2,85} = 5.731$ Sig. $> .01$

MEANS

Group	Pre-Test Mean	Post-Test Mean	Adjusted Mean
1. EH Control I	4.07	4.65	4.76
2. EH Engineered	3.61	4.73	5.27
3. Normal Control II	4.87	5.52	4.89

t-TESTS

t-Tests	Sig.
$t_{1,2} = 3.39$	.01
$t_{1,3} = .87$	N.S.
$t_{2,3} = 2.52$	.05

The Analysis of Covariance data for the Task Attention measure is reported in Table 15. The significant F (beyond the .05 level) reveals differences between the groups and the t-test evaluation indicator:

1. The Engineered Classroom group was superior in Task Attention as compared to Control Group I but not significantly different from Control Group II.

2. Control Group II was significantly different from Control Group I on Task Attention.

Table 16 reports the trends for the seven four week intervals for Task Attention. The variable N reported reflects the unavailability of adequate data on some students during the seven week period. In each case, Group 1 (the Control Group I), Group 2 (the Engineered Classroom group) and Group 3 (Control Group III. The following may be summarized:

1. During intervals 1 and 2, the Engineered Classroom group and Control Group II are not different but both superior to Control Group I.

2. During intervals 3, 4, and 5, Control Group II is higher than Control Group I but no other significant difference exist with respect to the Engineered Classroom Group.

3. During intervals 6 and 7, the Engineered Classroom group is higher than Control Group II and in interval 6, the Engineered Classroom group is superior also to Control Group I. In interval 7, the Engineered Classroom group and Control Group II are superior to Control Group I.

Figure 2 presents a graphic picture of the Task Attention percentages reported in Table 16.

The On Task behavior evaluation is presented in Table 17. Since the F is non-significant, we can not assume that this dependent variable measured significant differences between the three groups when the initial and final measures were utilized. When a week breakdown is made, as shown in Table 18, the following is seen:

1. During interval 1, Control Group II is significantly higher than both the Engineered Classroom and Control Group I.

2. During interval 2, the Engineered Classroom group and Control Group II are not significantly different but both are higher than Control Group I.

TABLE 15

ANALYSIS OF COVARIANCE, MEANS AND t-TESTS FOR TASK ATTENTION

ANOVA

Source	S S	d f	Mean Square
Treatments	1798.68	2	899.34
I. D.	18293.34	86	212.71
Total	20092.02	88	

$F_{2,86} = 4.23$ Sig. $> .05$

MEANS

Group	Pre-Test Mean	Post-Test Mean	Adjusted Mean
1. EH Control I	71.80	75.77	76.06
2. EH Engineered	83.53	88.20	88.08
3. Normal Control II	85.40	85.17	84.99

t-TESTS

t-Tests	Sig.
$t_{1,2} = 3.19$	.01
$t_{1,3} = 2.37$	.05
$t_{2,3} = .82$	N.S.

TABLE 16

TASK ATTENTION OVER THE SEVEN, FOUR WEEK PERIODS

Period	Group	N	Mean	Group Comparisons	t	Sig.
1	1	27	72.67	1.2	5.05	.01
	2	29	83.38	1.3	6.81	.01
	3	27	87.37	2.3	1.88	N.S.
2	1	30	75.27	1.2	3.86	.01
	2	28	86.04	1.3	3.37	.01
	3	29	84.59	2.3	.52	N.S.
3	1	29	74.07	1.2	1.74	N.S.
	2	17	81.47	1.3	2.62	.05
	3	28	83.71	2.3	.52	N.S.
4	1	26	76.96	1.2	1.67	N.S.
	2	23	82.17	1.3	3.12	.01
	3	26	86.46	2.3	1.37	N.S.
5	1	24	74.33	1.2	1.20	N.S.
	2	24	80.29	1.3	2.12	.05
	3	20	85.30	2.3	.97	N.S.
6	1	27	78.44	1.2	2.18	.05
	2	27	85.70	1.3	1.81	N.S.
	3	25	84.60	2.3	.33	N.S.
7	1	21	74.71	1.2	3.38	.01
	2	27	87.93	1.3	2.16	.05
	3	18	84.06	2.3	.95	N.S.

Group 1 = Control Group I

Group 2 = Engineered Classroom

Group 3 = Control Group II

TABLE 17

ANALYSIS OF COVARIANCE, MEANS AND t-TESTS FOR ON TASK MEASURE

ANOVA

Source	S S	d f	Mean Square
Treatments	479.99	2	240.00
I. D.	13834.36	86	160.86
Total	14314.35	88	

$F_{2,86} = 1.49$ N. S.

MEANS

Group	Pre-Test Mean	Post-Test Mean	Adjusted Mean
1. EH Control I	77.09	79.70	80.34
2. EH Engineered	79.13	84.03	84.28
3. Normal Control II	85.10	86.93	86.05

TABLE 18

ON TASK OVER THE SEVEN, FOUR WEEK PERIODS

Period	Group	N	Mean	Group Comparisons	t	Sig.
1	1	23	76.13	1.2	1.27	N.S.
	2	30	79.33	1.3	4.03	.01
	3	22	87.05	2.3	3.03	.01
2	1	30	75.33	1.2	2.35	.05
	2	28	82.57	1.3	3.43	.01
	3	25	86.24	2.3	1.14	N.S.
3	1	29	72.59	1.2	1.92	N.S.
	2	18	81.17	1.3	4.42	.01
	3	25	90.56	2.3	2.04	.05
4	1	26	76.58	1.2	1.49	N.S.
	2	27	81.70	1.3	2.44	.05
	3	24	85.21	2.3	1.00	N.S.
5	1	24	79.96	1.2	.26	N.S.
	2	25	81.16	1.3	1.02	N.S.
	3	24	84.67	2.3	.77	N.S.
6	1	27	76.52	1.2	2.30	.05
	2	27	84.18	1.3	2.72	.05
	3	26	85.65	2.3	.43	N.S.
7	1	22	76.05		2.21	.05
	2	25	84.80		2.43	.05
	3	17	86.71		.45	N.S.

Group 1 = Control Group I

Group 2 = Engineered Classroom

Group 3 = Control Group II

3. For interval 3, Control Group II is higher than both EH groups with these groups not significantly different from one another.

4. During interval 4, Control Group II is superior to Control Group I with no significant differences found in relation to the Engineered Classroom Group.

5. Interval 5 reveals no differences which are significant.

6. For intervals 6 and 7, the Engineered Classroom group and Control Group II are not significantly different but each is superior to Control Group I.

Figure 3 graphs the interval On Task percentage means for the three groups. There is a gradual tendency for the Engineered Classroom group to slowly approach Control Group II while Control Group I ends up approximately where it started.

From the Task Attention data, we see the Engineered Classroom group function close to Control Group II at the beginning of the year and above Control Group I and moving to a significantly higher position than Control Group II during intervals 6 and 7. Evidence here suggests the Engineered Classrooms are functioning very much like their normal counterparts in this area. The On Task behavior measure was not sensitive and differences in the same fashion which may be related to the fact that it was a less continuous measure (20 second samples) than the Task Attention measure (5 minute continuous samples).

The final data gathered in this matched group comparison relates to deviate behavior occurring among the groups according to the Classroom Behavior Problem Checklist.

Figures 4 through 11 graph the per cent of deviate behavior in out of seat, physical contact, vocalization, isolation, noise and turning categories as well as teacher contact over the seven four-week intervals for the three matched groups. The percentages are in relation to total time observed and in some cases fall below the 1% level. Therefore, the graphs must be read with particular care. Since the percentages are relatively low in all cases, no attempt was made to statistically evaluate differences between groups. The results will be discussed on a descriptive level only.

Figure 4 reports out of seat behavior. As can be seen, Control Group I maintains the highest over-all percentage and Control Group II increases in out of seat behavior in the year. The Engineered Class-

Figure 2

Graph of Engineered Class, Control Class I (EH) and Control Class II (Regular) for Mean TASK ATTENTION percentages averaged for Four Week Intervals during the Fall and Spring Semesters 1968-69 (after Hewett, Taylor, Artuso 1967)

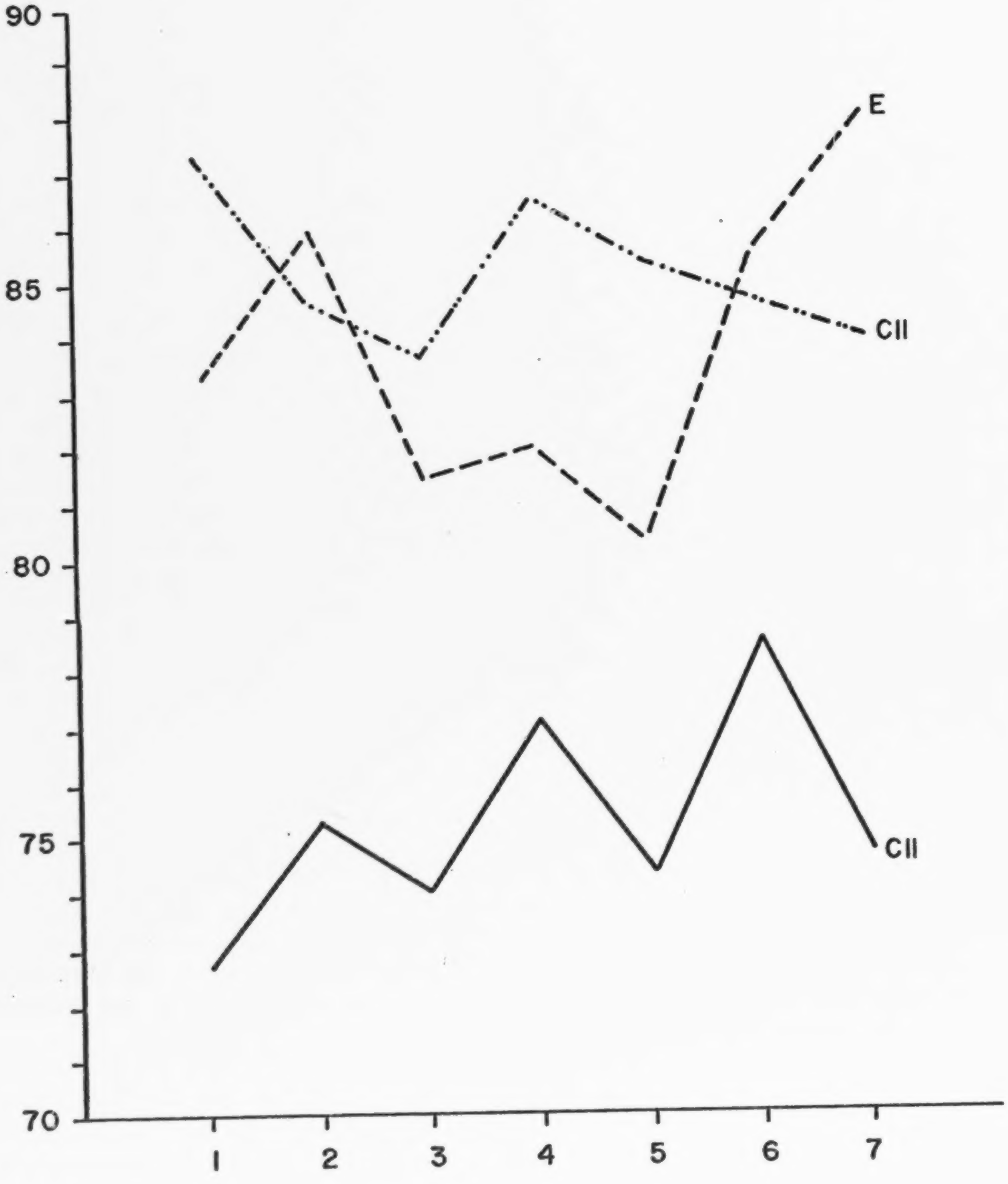
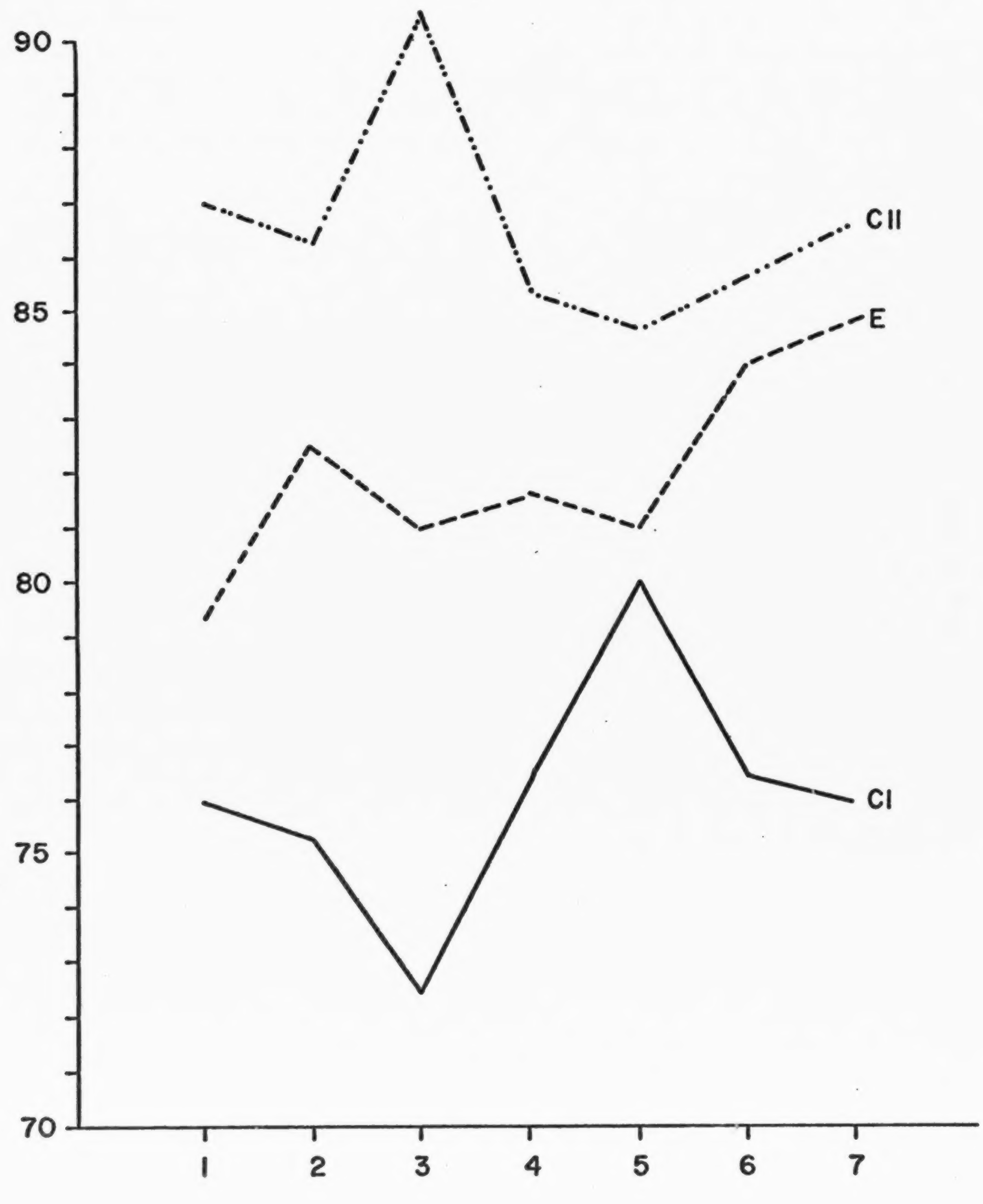


Figure 3

Graph of Engineered Class, Control Class I (EH) and Control Class II (Regular) for Mean ON TASK percentages averaged for Four Week Intervals during the Fall and Spring Semesters 1968-69 (after Quay & Werry 1967)



room group, except for interval four, maintains a one percent out of seat level on the year, lower than the other two groups. In Figure 5, Control Group I and the Engineered Classroom group are somewhat similar in amount of physical contact demonstrated although all percentages are below 1%. Control Group II varies very little over time.

The presence of considerable teacher-child interaction in the Engineered Classroom is attested to in Figure 6 which graphs percent of time spent in positive and negative contact by both teacher and child. This group shows over twice the teacher and child positive interaction over the two control groups which are maintained about on the same level. The percentage of time spent in teacher and child negative interaction drops to less than one percent for all groups with the Engineered Classroom group demonstrating slightly higher percentages here.

In general, Figures 7 through 10 show the Engineered Classroom group highest in vocalization, isolation, noise and turning with Control Group I next and Control Group II lowest. This tends to refute the impression some may have of a structured program as being overly suppressive. Despite the presence of vocalization, noise and turning slightly above the frequency found in a regular classroom for either EH or normal children, students in the Engineered Classroom were generally more attentive and made sizeable academic gain. This suggests that total behavioral control and creation of a deviant behavioral vacuum may be of more theoretical rather than practical significance. The isolation category was higher for the Engineered Classroom group largely due to the use of planned "time outs" as part of the intervention procedure. Such a planned intervention procedure was not used in Control Group I or II.

Figure 11 shows that Control Group I spent more time in situational deviant behavior than either the Engineered Class group or Control Group II. Other deviant behavior includes day dreaming and doing tasks not assigned. The high number of positive teacher contacts in the Engineered Class probably accounts for the lower, other deviant behavior percentages for that class.

The next chapter will serve as a summary for this chapter and present a discussion and conclusions based on the findings reported here.

Figure 4

Graph of Engineered Class, Control Class I (EH) and Control Class II (Regular) for Mean OUT OF SEAT percentages averaged for Four Week Intervals during the Fall and Spring Semesters 1968-69 (after Quay & Werry 1967)

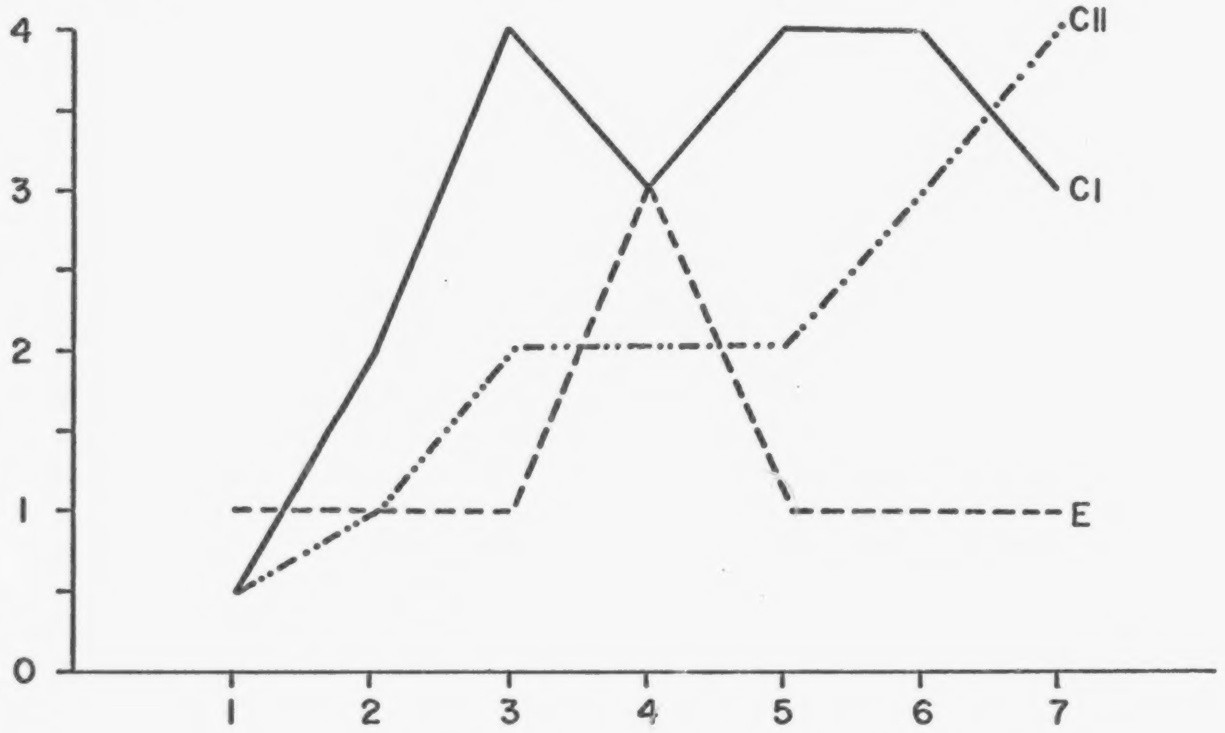


Figure 5

Graph of Engineered Class, Control Class I (EH) and Control Class II (Regular) for Mean PHYSICAL CONTACT percentages averaged for Four Week Intervals during the Fall and Spring Semesters 1968-69 (after Quay & Werry 1967)

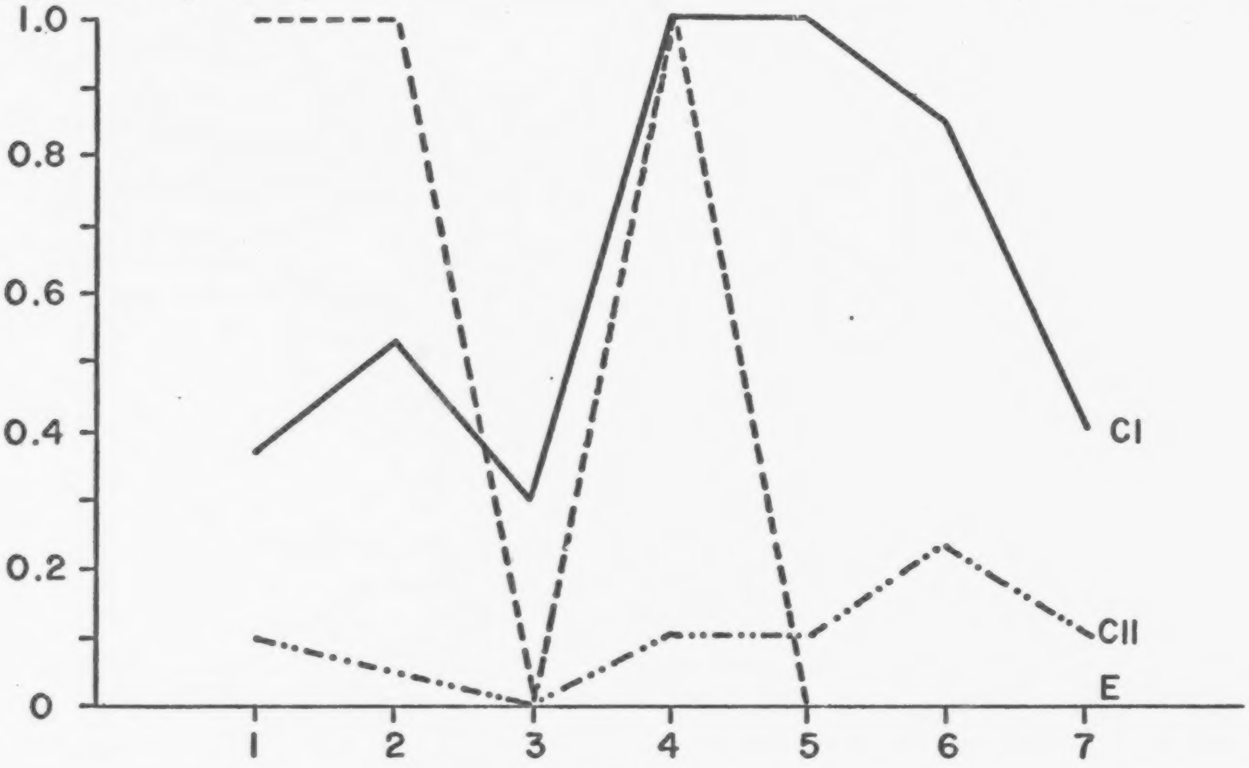
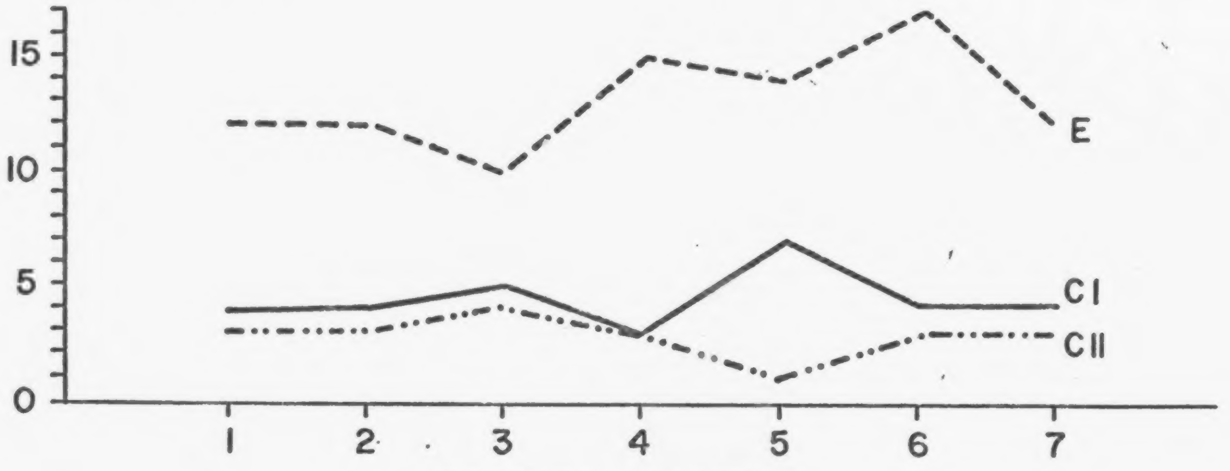
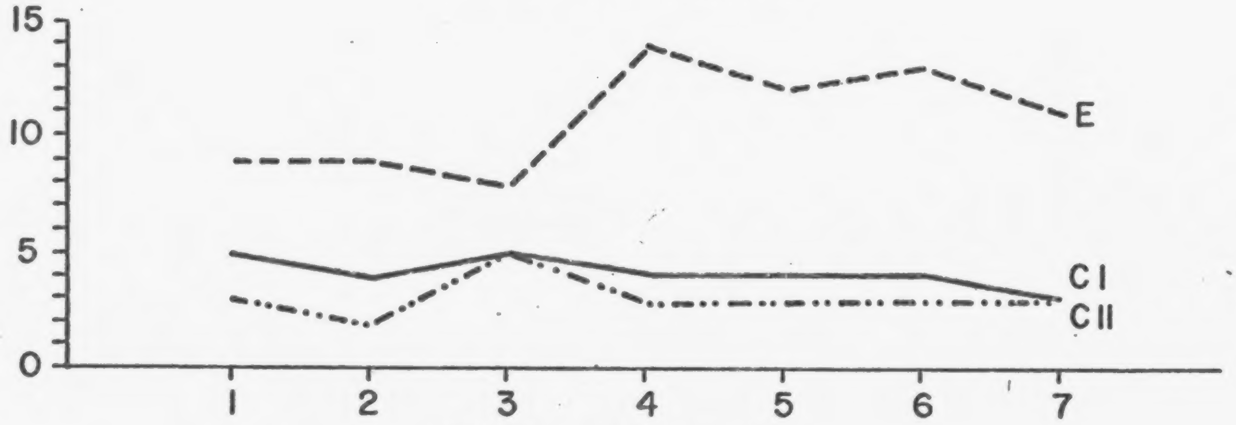


Figure 6

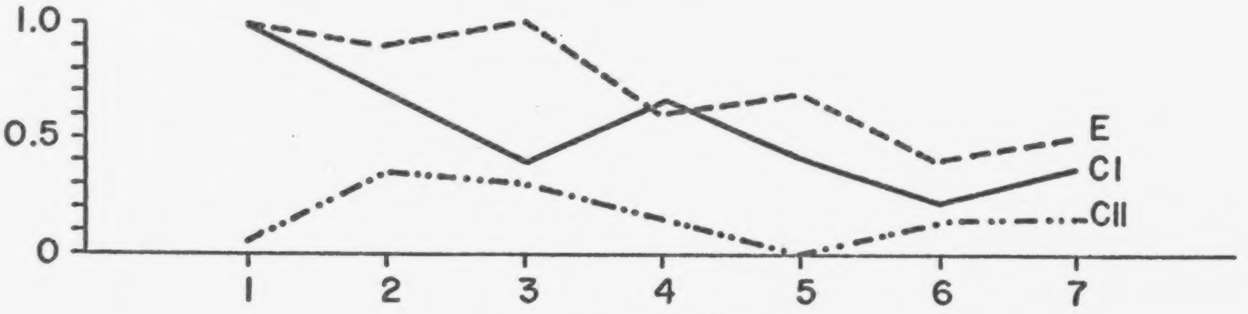
Graph of Engineered Class, Control Class I (EH) and Control Class II (Regular) for Mean TEACHER CONTACT percentages averaged for Four Week Intervals during the Fall and Spring Semesters 1968-69 (after Quay & Werry 1967)



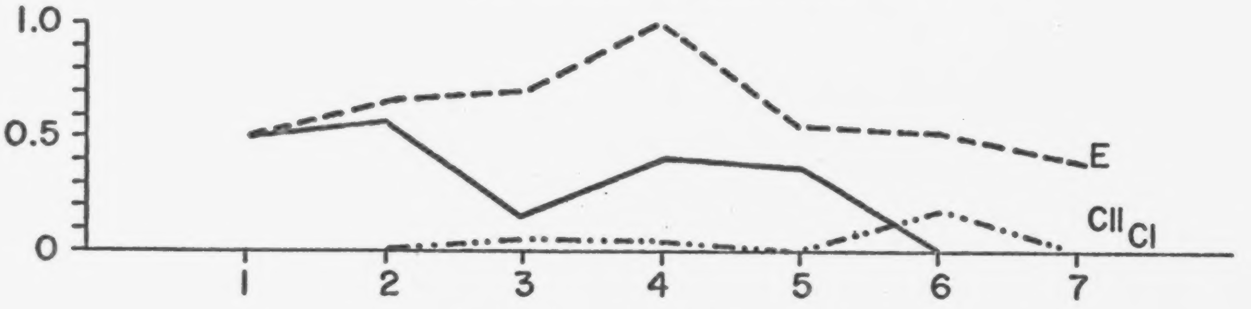
TEACHER POSITIVE



CHILD POSITIVE



TEACHER NEGATIVE



CHILD NEGATIVE

Figure 7

Graph of Engineered Class, Control Class I (EH) and Control Class II (Regular) for Mean VOCALIZATION percentages averaged for Four Week Intervals during the Fall and Spring Semesters 1968-69 (after Quay & Werry 1967)

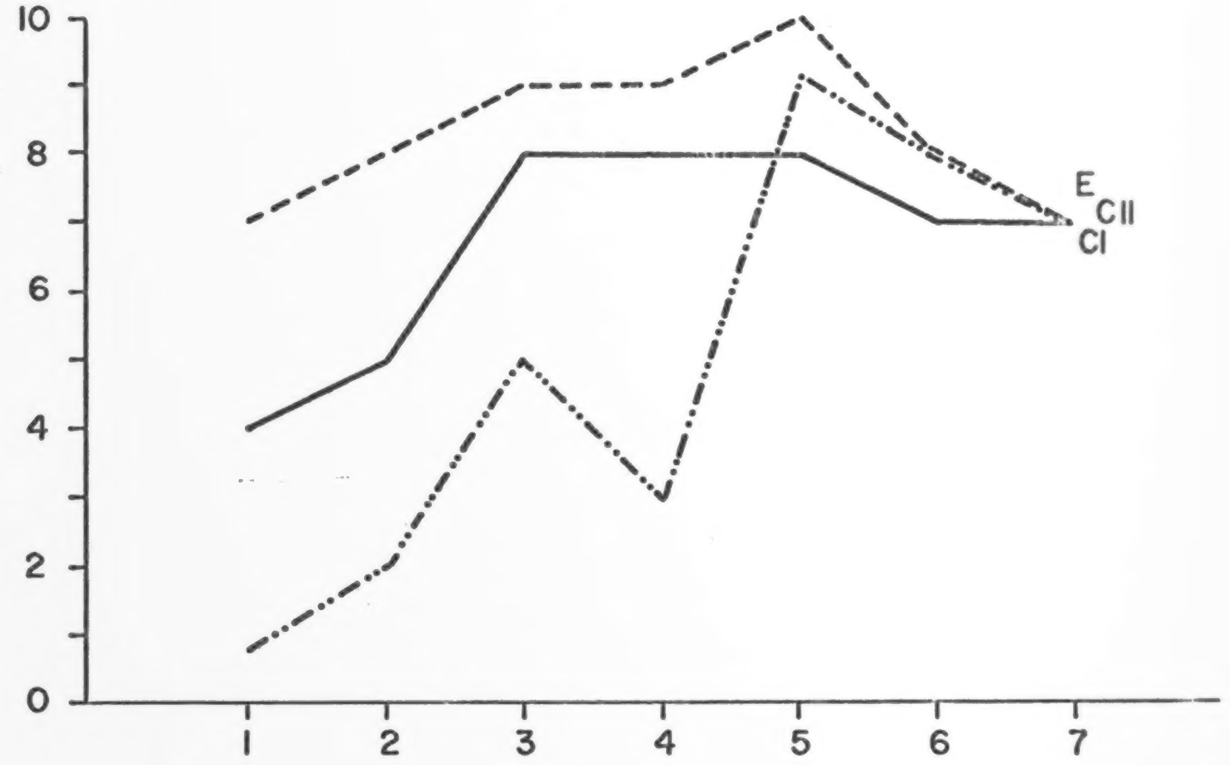


Figure 8

Graph of Engineered Class, Control Class I (EH) and Control Class II (Regular) for Mean ISOLATION percentages averaged for Four Week Intervals during the Fall and Spring Semesters 1968-69 (after Quay & Werry 1967)

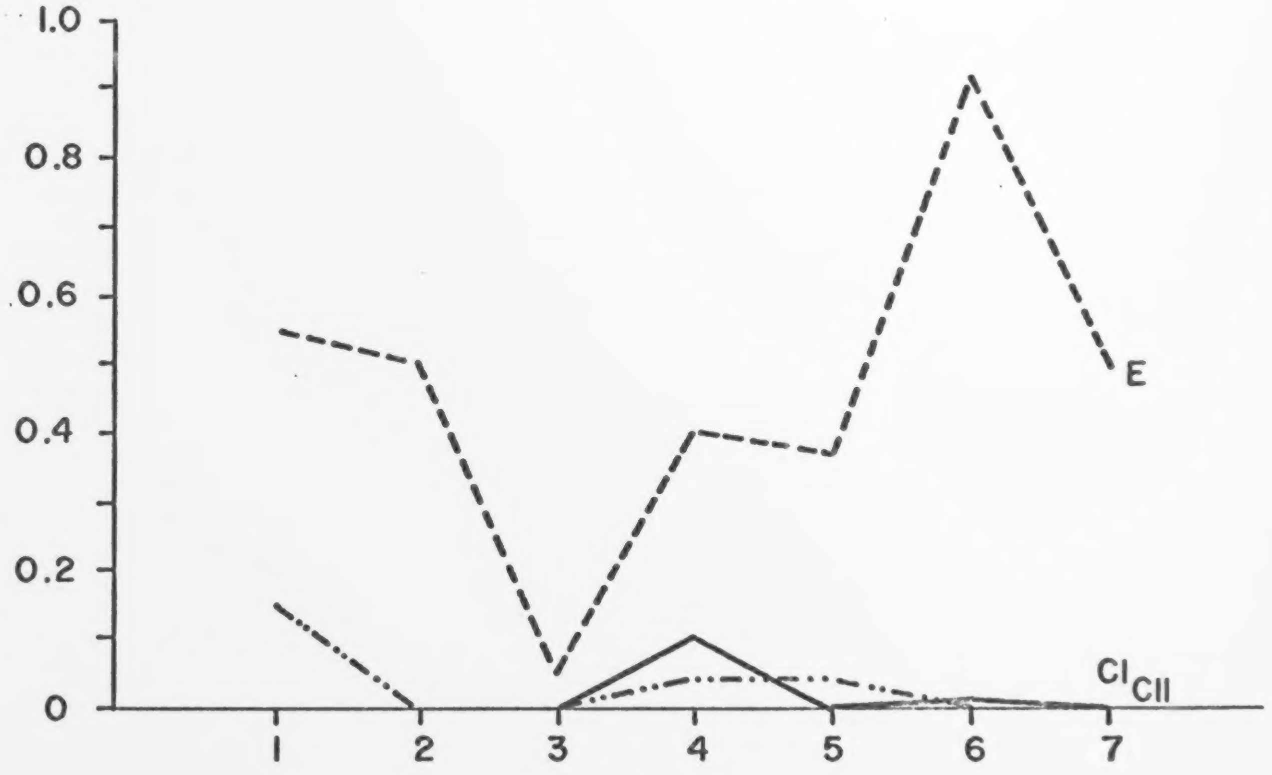


Figure 9

Graph of Engineered Class, Control Class I (EH) and Control Class II (Regular) for Mean NOISE percentages averaged for Four Week Intervals during the Fall and Spring Semesters 1968-69 (after Quay & Werry 1967)

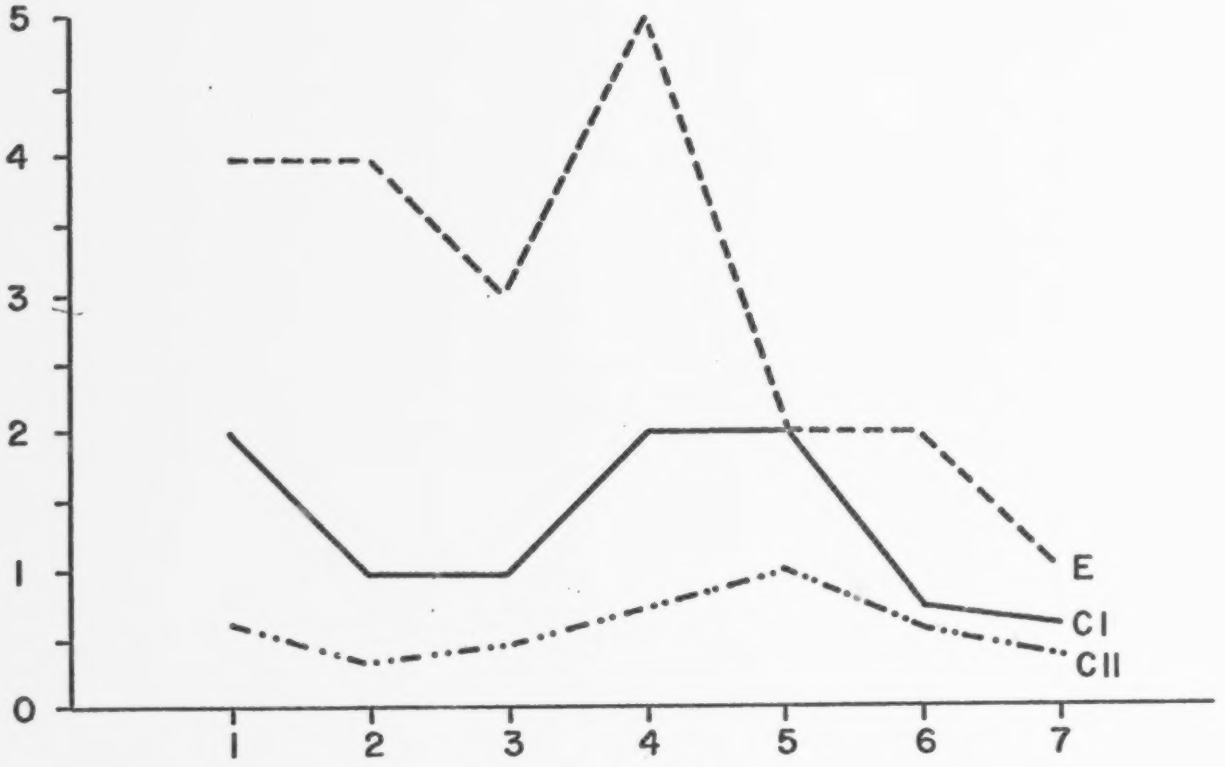


Figure 10

Graph of Engineered Class, Control Class I (EH) and Control Class II (Regular) for Mean TURNING percentages averaged for Four Week Intervals during the Fall and Spring Semesters 1968-69 (after Quay & Werry 1967)

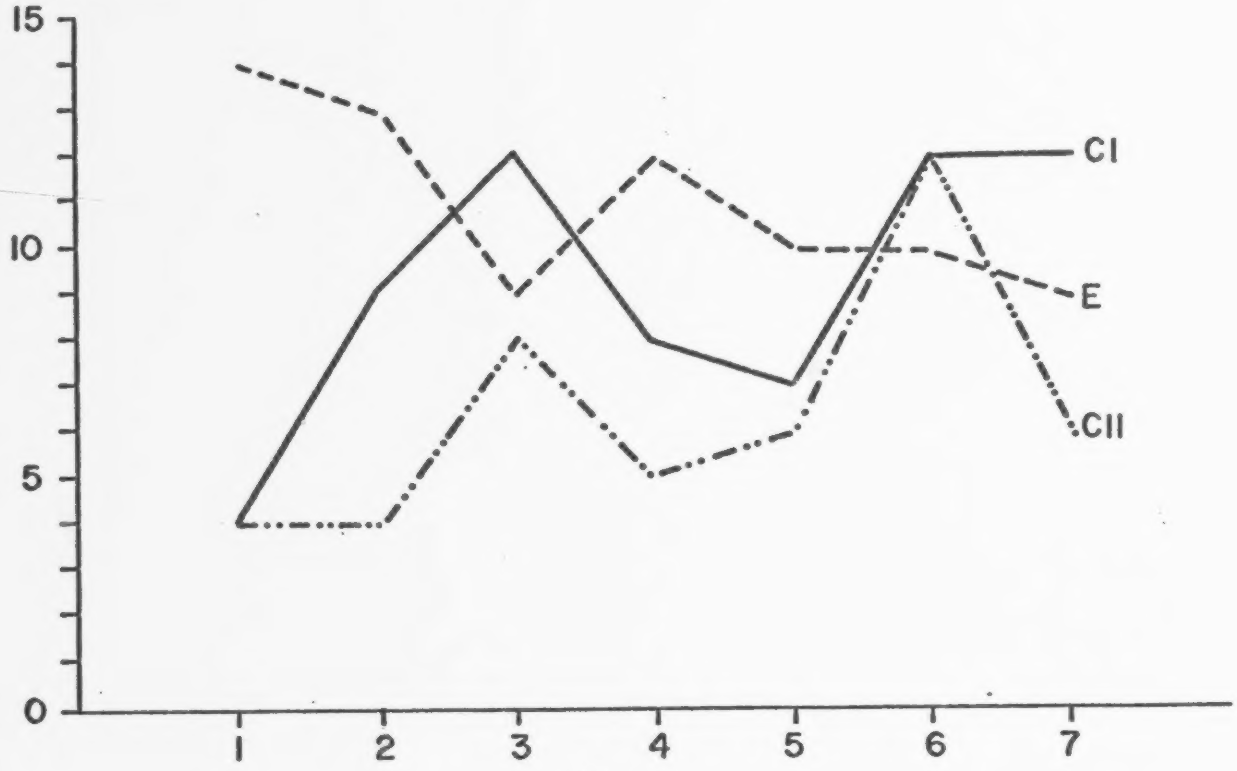
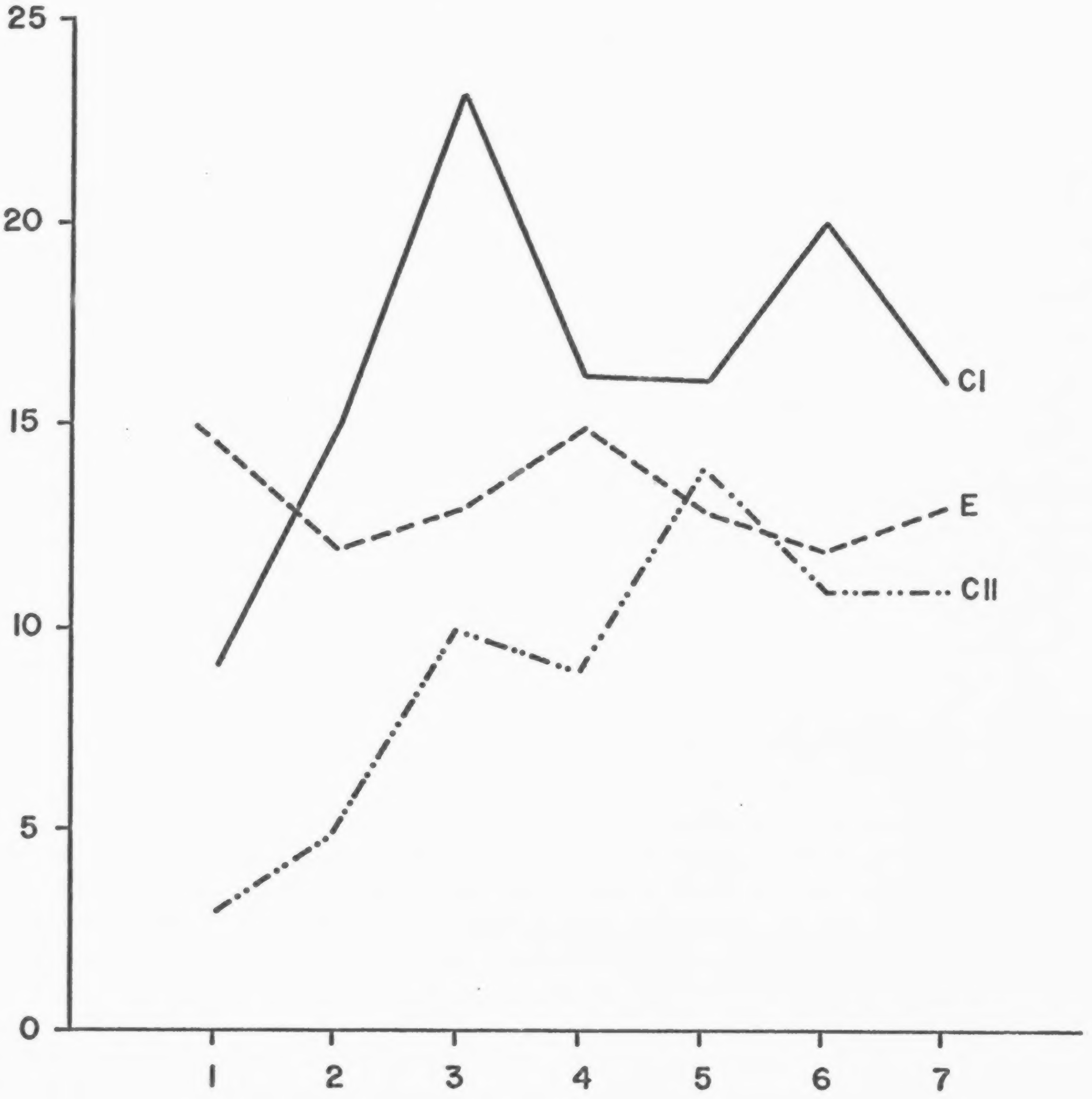


Figure **11**

Graph of Engineered Class, Control Class I (EH) and Control Class II (Regular) for Mean OTHER percentages averaged for Four Week Intervals during the Fall and Spring Semesters 1968-69 (after Quay & Werry 1967)



CHAPTER IV

Conclusions

Phase Two of the Santa Monica Project was devoted to replicating, extending and more critically evaluating the Engineered Classroom design as formulated and studied in Phase Two. Questions of concern during Phase Two were:

1. Can the academic emphasis of the program be increased to assist children more in reading, without sacrificing the pre-academic "launching" orientation of the program?

2. Can younger and older children than those in the upper-elementary range studied in Phase One profit from the program?

3. How can reintegration of children placed in the Engineered Classroom be accomplished and is it feasible to alter the concept of the room as self-contained to a part-time resource room?

4. How were children enrolled in Phase One doing two years later during Phase Two? Had any of them been successful readjusting in the regular classroom?

5. How does the academic and behavioral functioning of children enrolled in the Engineered Classroom compare with that of similar children and normal children in the regular classroom?

The answer to these questions were at least partially provided during Phase Two. Mean reading achievement gains were twice as great for the total Phase Two Engineered Classroom group as for the year long experimental class in Phase One. The reason here seems to be related with greater sophistication on the part of the staff with respect to 1) more quickly recognizing individual children's specific reading needs and 2) greater familiarity with the range of existing reading program for use in the reading program. Material such as the Sullivan Reading Program, Bank Street Reader and the Phonovisual approach proved very valuable during Phase Two. It was found that more grouping of children with similar reading problems could be accomplished in the Engineered Classroom without affecting the individual orientation of the program. Also, some of the pre-academic class time previously devoted to exploratory and communication activities was profitably shifted to work on reading for children with serious reading deficits. This seems to add up to a validation of a point made earlier by the authors - that is that the Engineered Classroom really provides a useful framework within which a wide range of teaching emphasis may take place - not a rigid "cook-book" formula which must be followed in exact detail to be successful. As the authors have journeyed around the country talking with educators who have explored use of the design with children with a wide range of intelectual, behavioral, and cultural problems they have found no two adaptations the same. Various programs have taken on the emphasis viewed as most needed by the teacher in terms of their own experience and the particular problem of the children with whom they worked.

The inclusion of younger children in the program provided surprisingly little difficulty. It might be anticipated that in a group of nine children, grades 2 - 6, the younger children would be intimidated or overwhelmed by the larger older children and that these latter children might in turn resent being in a class with "babies". In practice this did not occur. The total individual orientation ("This is really nine classrooms, one classroom for each child based on what he needs to learn") plus greatly limiting group activities seemed to eliminate problems either way. The widening of age span probably makes group work and social interaction emphasis more difficult and lends support for the direction the Engineered Classroom has been going in - namely, conceive of it as a resource room and preserve a link with a regular class home base with every child whenever possible. In a more homogeneous grade and age setting social activities are certainly more appropriately provided.

Secondary students with academic and behavior problems have received less attention than elementary children in the devising of special approaches and techniques. This is highly regrettable since for the 7th, 8th, and 9th grader in trouble in school time is really running out and every effort should be made to bolster him so that more adequate social, educational and vocational preparation can occur by gra grade 12. The Engineered Classroom was connected to the junior high school level with good results. The basic goals - something for everybody, meaningful reward and flexible structure, plus provision for individualized instruction within a climate guaranteeing success - know no age limit in any special education program, including those for children with intellectual, cultural, and physical handicaps. Male teachers appear somewhat more successful here since a majority of students are boys and in many cases it has been found they had developed particularly negative attitudes toward female suthority figures in school. Increased academic emphasis occurred with little difficulty since the achievement level of the older student usually were at a level where a wide variety of materials might be found.

Integration of the special class child is receiving increased attention today. The "swinging door" concept of easy access to both special and regular classes appear far more useful than the "closed door" concept of either setting. During Phase Two the authors explored a compulsory reintegration approach and found that a sizeable number of children who were successful in being maintained in regular classes would not have been selected in advance by the special teacher who had worked with them previously as ready to return. This offers interesting evidence regarding the effect of maturation over summer, teacher differences, setting and class differences as they may relate to an educationally handicapped child being successful in school. The compulsory reintegration approach may give way to a more careful and consistent gradual reintegration over the year so that complete reassignment may occur more gradually. Its value appears in gaining information regarding the regular class adjustment potential of children in special classes, particularly in programs where manpower and time limitation preclude the thoughtful, systematic reintegration approach.

The follow-up study of Phase One students was reassuring in regard to the behavioral potential of the educationally handicapped child for regular classroom functions. With a year of special help, attitudes and pre-academic behavior do seem to change markedly for most such children. Academically, there is still much work to be done and while the Phase Two academic gains were greater in reading over Phase One there are still unanswered questions with respect to whether academic deficits can be made up in a regular class once the child is tolerable in terms of behavior or whether a separate special class, heavily oriented toward remedial instruction is necessary for such children. This question needs further study and hopefully continuing efforts by the Santa Monica Schools will shed light on it.

Phase Two did dramatically illustrate the superior behavior and academic progress made in the Engineered Classroom in comparison to a regular classroom for the EH child. In fact, EH children in the Engineered Classroom closely approximated (and in some cases exceeded) the academic and behavioral gains of normal children. What was necessary from the matched group comparison was data on a special class of nine students, a teacher and aide which did not use the Engineered design and which used another bype of emphasis. In other words what was the contribution of the limited teacher-pupil ratio? This type of comparison group has been difficult to locate since districts outside of Santa Monica have not felt that their EH classes could tolerate the presence of outsiders or observers. It does, however, constitute a piece of unfinished business in evaluating the contributions of the Engineered Classroom design.

In summary, Phase Two found that academic emphasis in reading could be increased in the Engineered Classroom with good results and that the program could include both primary and secondary students effectively. Reintegration in the regular classes for EH children can be done on both a gradual and compulsory basis and the difficulty in truly assessing a given child's readiness to be back in a regular room, at least for a limited period of time, demonstrated. The pre-academic focus of the Engineered Classroom has been validated in that a majority of Phase One returnees to the regular classroom were average or above average in their behavioral functioning after one or two years in the program. Finally, EH children in the Engineered Classes outdistance their EH counterparts in the regular classroom and approach or exceed normal controls academically and in relation to Task Attention. More positive teacher and child interaction takes place in the Engineered Classroom and, in general, more behavior characterized by Quay & Werry (1967) as deviant (except 'out of seat') also occurs. This is seen as evidence that the Engineered Design is not totally suppressive and that the level of deviant behavior shown may still be within limits required for effective classroom functioning.

This report brings work to a close which began in 1966. Over the past three years the authors have struggled to directly attack the gap between theory and practice, diagnosis and program, with a specific plan based on a broad developmental and behavioral concept. It is hoped that continuing efforts to refine and modify what has been contributed over this period will eventually result in greatly increasing the quality and efficiency of education for children in trouble in school.

APPENDIX I

The Engineered Classroom: An Innovative Approach to the Education of Children with Learning Problems*

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Alfred A. Artuso, Ed.D.
Santa Monica Unified School District

Special education has long been enamored with rich descriptive statements and impressive, if ominous, diagnostic terminology as it has labored to place children with behavioral and learning problems in some sort of educational perspective. In the process the field has borrowed freely from disciplines of psychiatry, medicine, and neurology and has legislated their terms and labels for use in the school. Despite the authoritative ring to such terms as "school phobia," "ego deficiency," "dyslexia," and "minimal cerebral dysfunction," these descriptions of children who are fearful of coming to school, refuse to obey the rules, have difficulty learning to read, and who demonstrate perceptual-motor problems are non-relevant and almost totally useless in the classroom. In addition, they foster a point of view in reference to the child that suggests he is first a psychiatric or neurological casualty and only secondarily an educational problem.

Recently, a behavioristic point of view has gained attention in the field of special education with children with behavior and learning disorders. It has introduced certain innovative practices into the field - the Engineered Classroom reflecting some of them. It approaches these children in an open-minded manner and suggests that education can indeed 'make a difference' in their lives by aiding them in the acquisition of behavior related to success in learning and diminishing the frequency of behavior which interferes with learning. The problem is presented as one of 'behavior' not 'psyche' or 'tissue' and thus is far more closely related to the expertise possessed by most teachers. However, the behavioral approach has produced a noticeable hue and cry from some special educators. Some of them may view a shift toward a behavioral orientation as robbing them of some of their glamorous alliances with psychiatry and medicine, or of stripping their vocabulary of a variety of prestigious labels and reducing them to the level of learning technicians rather than "educational therapists" or "remedial diagnosticians."

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*Prepared for Mr. Warren J. Aaronson, Director, Title III Program, Project Centers Branch, Bureau of Education for the Handicapped, United States Office of Education.

The behavior approach which has been referred to as behavior modification is also charged with being "simpleminded" or "intellectually bankrupt," because it views the child as an organism of the moment whose 'now' behavior is of concern rather than considerations of 'why.' Also the use of systematic, environmental manipulation, involving both stimuli and consequences, seems sterile and non-dependent on such valued teaching attributes as artistry and intuition.

In truth, behavior modification is simpleminded. It looks at the basic ingredients of the teaching and learning act and communicates to the teacher the importance of setting terminal goals, analyzing these goals into reasonable task components, rewarding the child when he approaches a goal through some task level accomplishment and non-rewarding him if he fails to take a step, even part-way, which according to everything known about him is fair and reasonable to expect. Behavior modification is also simpleminded in that it directly focuses on doing something about two lofty notions of special education--individualizing instruction and guaranteeing success. These notions are referred to again and again in the literature, but the specific methodology, the step-by-step design for accomplishing them is greatly neglected. You individualize instruction by maintaining a broad, total picture of what learning is all about in the first place.

Over the past three years in a project largely funded by two Title III Demonstration Grants, the Santa Monica Schools in California have implemented a point of view with respect to what learning is all about based on the concept of a developmental sequence of educational goals (Hewett, 1968). These goals or behavioral categories move from attention, response, order, exploratory, social, to mastery. The implication is that we must gain a child's attention and make contact with him, get him to participate and respond in learning, aid him in adapting to routines and direction following, help him accurately and thoroughly explore his environment through multi-sensory experiences, learn to gain the approval of others and avoid their disapproval, and finally master academic skills of reading and arithmetic and gain knowledge in curriculum content areas. The child is taken where he is on this developmental sequence, his weaknesses bolstered and his strengths supported. Psychiatric and neurological problems become learning and educational problems, and special educators become teachers rather than junior psychotherapists or psuedo-neurologists. This behavioral description is only a first step, and problems certainly still exist with respect to specifically assessing a given child using the developmental sequence and devising curricula to aid him at one or more work levels. The contribution here is in shift in point of view. No grandiose, final claim that once and for all our problem of description in special education with children with behavior and learning disorders is intended.

Continuing a review of the simpleminded approach of behavior modification to special education, let's take a look at that platitude of platitudes in the field "guarantee the child success." It is obvious that you must start with individualized goals as discussed above, but goals without methods leave both teacher and child stranded on the launching pad of learning. One of the realities of learning is that we learn because there is something in it for us. In more direct terms, rewards are important in learning. Most teachers do not have a fondness for focusing on this bit of educational reality. Children learn for the "joy of learning." Learning is its own reward. Thus, when some children refuse to or are unable to learn, scant consideration may be given to "what's in it for them" in the first place. There are at least three major "somthings" in it for children who come to school and enter the classroom. One something can be called knowledge of results and refer to the grades and acknowledgement which are provided and which evaluate the child's performance according to various criteria of excellence. Another has to do with the obtaining of social attention and praise of others, particularly the teacher. The last "something" relied on, but often not recognized, can be referred to as sensory-motor experiences. Children find classroom environments and activities exciting to look at, listen to, touch, and move through. A fourth class of "somethings" recognized as respectable by behavior modification, but often shunned by educators, are tangible rewards. Most children do not need food, trinkets, or candy to motivate them in learning, but some who have continuously failed and been denied the available rewards of good grades, praise and approval, and interesting activities may greatly profit from their presence in the classroom in the initial stages of a special program. Use of such primitive rewards when necessary is both logical and temporary. When a child is unable to manipulate number symbols to solve the problem, 6 + 2, we do not hesitate concretizing the problem with such aids as counters, sticks, or other objects. Six concrete items added to two concrete items equals eight--count them--one, two, three, four, five, six, seven, eight. This logic is applicable to children who find nothing rewarding in classroom learning. Concretize the reward and provide it on a less long range and abstract level than knowledge of results and you may include rather than exclude many children with learning and behavior problems. Just as the child who resorts to use of concrete items to solve basic number problems soon 'gets the idea' and manipulates numbers symbolically, so the child who initially learns for a tangible reward shortly becomes susceptible to more traditional and higher level rewards in learning. The secret is: don't lose the child because of a narrow range of tasks and goals and lack of imagination and flexibility in providing "something in it for him" in learning. Guaranteeing success can become a common classroom occurrence for children with learning and behavior problems if teachers carefully select tasks, increase expectations in thimblesful rather than bucketsful measure, systematically provide meaningful consequences in teaching, and are prepared to back up and re-evaluate existing demands at a moment's notice if it appears the child cannot handle them. Decreasing the probability of 'losing the child' through consideration of the above is a major offering of the behavior modification approach to education.

Sounds acceptable, doesn't it? In fact what is implied here is implementation of good, sound teaching practices. The trouble is word has gotten out that the significance of these considerations was first discovered in animal laboratory research, not the human classroom. That is all it takes to 'lose the teacher' in many instances when this approach is being discussed. Secondly, there is an emphasis on efficiency which runs counter to the "cafeteria electicism" of many special educators. Teachers are accountable for managing a learning environment including selection of stimulus materials, scheduling of consequences, and maintenance of fair yet predictable and consistent structure. In addition, viewing emphasis on rewards as "bribery," manipulation of environmental variables as "brainwashing" and systematic teaching as "non-humanistic" have restricted the acceptance of the behavior modification approach by the special education field.

A common term in behavior modification is 'shaping.' That is you take an individual exactly where he is and gradually "shape" his behavior toward a particular goal by first assigning him tasks well within his capability and then slowly but systematically increasing task complexity and move him toward the desired behavioral goal. Special education must be 'shaped' into recognizing the essential strengths of the behavior modification approach. The approach must hold promise for increasing the teacher's chances for 'making a difference' in the most difficult public school situation and must be translated pragmatically and not presented in the manner of the arrogant experimentalist who disdains application and service. An attempt at introducing behavior modification to special educators by means of such a shaping procedure is the Engineered Classroom design. This design has served as a model for the inductive teaching of special education that behavior modification principles make good educational sense and can greatly aid in achieving individualization of instruction and the guarantee of success. The design sets up a classroom environment, schedule, curriculum, and operations consistent with behavior modification principles and the developmental sequence of educational goals mentioned earlier. It has been systematically investigated in the Santa Monica schools for the past four years.

Prior to this time, the Santa Monica Unified School District had been concerned about the increasing number of inattentive, failure-prone, hyperactive children who are average, or above average, in intelligence but who could not be contained within the usual classroom structure. Often all appropriate public school techniques had been exhausted and both teachers and administrators were unable to find a suitable solution for these students. Repeated parent conferences, transfers to other classrooms or schools, intervention from outside agencies, suspensions, and home instruction had all been utilized with little or no noticeable effect.

The school district recognized that these students had the potential to achieve in school if some appropriate program could be developed for them. It was obvious that the increasing number of suspensions and the ever greater number of children assigned to home teachers was not an effective way to meet the problem. At the same time, it was not feasible to leave the disordered student in the regular classroom. What was needed was an instructional program that would be understandable to a teacher, translatable to the classroom, and have promise for more effectively educating the child who is known as educationally handicapped or emotionally disturbed.

Dr. Alfred A. Artuso, Superintendent, and Dr. Frank D. Taylor, Director of Special Services of the Santa Monica Unified School District envisioned the Engineered Classroom design as developed at UCLA, as a possible solution to the problems described earlier. Through their leadership, the Engineered Classroom design has been investigated at the elementary and junior high school levels in Santa Monica with educationally handicapped children.

This cooperative endeavor between a public school system and a major university has proven very productive. The University provided the learning theory orientation and the knowledge for sound research studies. The public schools provided a resource for personnel in developing classroom procedures and curriculum while providing the opportunity of testing an educational innovation in the reality of the "real world." In the final analysis the value of any educational innovation must not be decided until after it has stood the test of a genuine public school situation.

With the above facts in mind, Dr. Artuso, and Dr. Taylor and myself planned to initiate classrooms for educationally handicapped students for the 1966-1967 school year. The U. S. Office of Education, Bureau of Handicapped Children and Youth, provided a Title III Demonstration grant to help support the project.

The result has been a demonstration of the Engineered Classroom model in up to twelve classrooms located at eleven separate schools. These schools operated in a typical urban community with the concerns of public school teachers, administrators, P.T.A. organizations, and parents while still encompassing the full spectrum of ethnic and socio-economic backgrounds of an average community.

The classrooms for educationally handicapped students as developed in Santa Monica provide the teacher with a structured plan for assigning appropriate tasks to students, providing meaningful rewards for learning, and for maintaining well defined limits in order to reduce, and hopefully eliminate, the occurrence of maladaptive behavior in school.

The Santa Monica Project, through the Engineered Classroom model, attempts to translate behavior modification principles and theories--not rigidly, but pragmatically--to a public school setting. Behavior modification principles such as immediate feed-back of results, building secondary reinforcement, shaping behavior through successive approximation, and focus on observable events are utilized in this design.

The design provides four important ingredients for the classroom teacher.

I - A Developmental Sequence of Educational Goals

The developmental sequence mentioned earlier, postulates six educational task levels--attention, response, order, exploratory, social, and mastery--and describes the educationally handicapped or emotionally disturbed child with respect to deficits at each level. Each level is considered in terms of three elements which are thought to be essential in all learning situations--a suitable educational task, provision for meaningful learner rewards, and maintenance of a degree of teacher structure or control.

While the ultimate goal of the teacher is to engage the student at the mastery level, children must first be considered in terms of their development at lower levels, and assignments in school must take this into account. In helping an educationally handicapped child get ready for intellectual training, the teacher can profitably use the behavior modification principle of shaping and rather than hold out for the ultimate goal (e.g., student achievement approximating the intellectual level) foster successive approximations of that goal (e.g., functioning at attention, response, acceptance, order, exploratory, and social levels). The Engineered Classroom design attempts to do just that.

The second element of the structure is the classroom settings.

II - Classroom Settings

The typical Engineered Class includes a large, well-lighted room with double desks (2' x 4') for each of its 9 pupils. The class is under the supervision of a regular teacher and a teacher aide. The aide need not be a credentialed or specifically trained individual. High school graduates and PTA volunteers have been employed.

The physical environment can be described according to four major centers, paralleling levels on the developmental sequence of educational goals. The Mastery Center consists of the student desk area where academic assignments are undertaken and study booths or "offices" where the student continues his academic progress in another postural setting without visual distraction. An Exploratory Center is set up near the windows with facilities for simple science experiments, arts, and crafts. There is a Communication Center where social skills are fostered. The Order Center consists of tables and a storage cabinet where games, puzzles, exercises and activities emphasizing attention, orderly response, and routine are kept. (Figure A)

The third element of the structure is the concept of the Work Record Card or the Check Mark System.

III - The Check Mark System

Mounted by the door is a work record card holder, much like a time card rack near the time clock in a factory. An individual Work Record Card for each student is in the holder. As each student enters the room in the morning, he picks up his individual Work Record Card which is ruled with 190 squares. As the student moves through the day, the teacher and aide recognize his efficiency to function as a student by giving check marks on the Work Record Card. The student carries his Card with him wherever he goes in the room. Check marks are given on a fixed interval basis with a possible 10 check marks available to the child each 15 minutes.

This system attempts to provide rewards on a concrete, immediate basis for children who have not been responsive to the more typical kinds of rewards provided by school (e.g., long range grades, praise, parental recognition, competition, etc.). The teacher attempts to convey the idea that check marks are objective measures of accomplishment and literally part of a reality system in the classroom over which the teacher has little subjective control. Students save completed Work Record Cards that can be exchanged for simple trinkets or candy (Phase I) earned time activity card, (Phase II) or a graphic report card (Phase III). (Figure B)

The fourth element of the structure is the use of interventions.

IV - Classroom Interventions

Earlier it was suggested that one of the essential ingredients in all learning situations was a suitable educational task--a task that made it possible for each individual student to succeed at all times. Thus, the teacher must be aware of each student's progress throughout the school day and be ready to intervene at any time when a given task assignment proves inappropriate. Nine specific interventions have been developed which encompass the six levels on the developmental sequence of educational goals.

As long as the child is able to stabilize himself during any of the student interventions, he continues to earn check marks on a par with those students successfully pursuing mastery level assignments. He is in no way penalized for the shift in assignments made by the teacher.

Each student starts his class day in either reading or written language activity. If, at any time, he begins to display signs of maladaptive learning behavior (e.g., inattention, day dreaming, boredom, disruption) the teacher has appropriate resources in the form of interventions to meet the situation.

Table A summarizes the interventions which may be utilized in an attempt to foster adaptive student functioning. The teacher may select any intervention seen as appropriate with a given student or may try the student at each intervention level until his behavior improves.

Actual practice has shown that it is only on rare occasions that the teacher needs to employ a time-out or exclusion.

The original daily schedule and curriculum of the Engineered Classroom has been constantly assessed and modified to assure maximum student progress. (Figure C) The emphasis is on meeting individual needs and avoiding busy work. The focus is on providing an instructional program that permits the teacher to teach a full day with virtually no disordered behavior from students.

The initial order period is designed to provide students with simple paper and pencil or concrete manipulative direction-following tasks stressing control and completion. Commercially available perceptual motor training work sheets are used along with simple tracing, design copying, and visual discrimination tasks. (Figure D)

The reading program is divided into three 15 minute periods.

Individual reading is done at the teacher's desk with each child. The child brings his work reader (a basal or remedial text close to his actual functioning level) to the desk and reads aloud with the teacher aide for a three minute period. The three minutes are timed by a small hour-glass which the child turns over when he is ready to start reading. As the child correctly completes each line of reading material, the teacher aide deposits a candy reward (M & M) in a paper cup beside him. The aide also keeps a record of each word the child misreads and these are printed on a 3 x 5 file card for later study. At the end of the 3 minute period, the teacher aide and child work on tasks that help develop comprehension and then the child takes the cup of candy and new reading words back to his desk. Candy is first used in this activity rather than check marks because of the high motivation exhibited by students for practicing their reading before going to the teacher aide's desk and their concentration during oral reading. Later, plastic counters may be dropped into the cup and counted or a tally kept of the number of lines read and this total graphed for daily progress comparisons.

After each child in a given group has had individual reading, an assignment wheel is turned; the teacher has all students put down their work and both teacher and aide circulate giving children their check marks. This takes approximately three to five minutes and the children learn to wait quietly for their check marks. The bonus check marks given for "being a student" will reflect such "waiting" behavior.

Next, the groups move to either word study or skill reading. Word study is done at the child's desk. The teacher circulates (while the aide continues individual reading with another group of three students) and works with individual students or small groups on reading skills. Spelling words acquired during story writing (discussed later) are also reviewed as spelling words at this time.

Following word study, the wheel is turned and check marks are given all students. It is important to point out that during the check mark giving period, not only is the previous assignment corrected and acknowledged with check marks, but the next 15 minute assignment is introduced. It has been found that this type of individual transition period is very useful in maintaining the work-oriented atmosphere in the class. The teacher does not rely on verbal assignments in front of the class or repeatedly calling out, "Boys and girls! Boys and girls! That means you too, Henry! Give me your attention! I am waiting for two people in row three." etc.

Skill reading involves an independent vocabulary and comprehension building activity and commercial materials, including programmed units, are used. The Santa Monica staff has developed various types of word games, decoding exercises, and other activities for use with poor readers who cannot work for any extensive periods of time in reading. (Figure E) The interventions used to assist a child who cannot do a reading assignment or any other assignment for a period of time utilize the centers around the room. Students may be assigned to do a simple puzzle at the Order Center, listen to the record player at the Communications Area or complete an art or science task at one of the other centers.

Twice a week, story writing is done by the entire class rather than in small groups. The teacher usually makes a short motivation presentation in some area of interest to the class (e.g., knighthood, deep sea life) and the students are encouraged to write about the topic.

Following either reading or story writing, the class is dismissed for recess. This is taken outside the room, and as each child leaves he puts his Work Record Card away in its holder. Upon returning the card is picked up and the children receive a possible ten check marks for the recess period.

The arithmetic period occupies the next hour, which is divided into three periods of about 15 minutes each. Arithmetic fundamentals, including basic addition and subtraction facts and concepts, the multiplication tables and process, and division are assigned as appropriate for the first 15 minute period. The Santa Monica staff has adapted and developed multi-level arithmetic drill sheets (Figure F) which can be quickly altered to fit a particular child's level in addition, subtraction, multiplication, or division, and these may be used with slower students during both the drill and skill periods. Following this, arithmetic skills are put to work in problem solving situations. Students are given pages torn from workbooks at or near their performance level during the next two 15 minute periods. It is important to stress that during arithmetic, however, all students receive check marks following each 15 minute interval.

A 10 minute nutrition period is held in the room and the children have a snack. They are allowed to move about the room and various free time activities are available. Ten check marks are given following this period and the children leave the room for physical education. Work Record Cards are taken outside to the playground and checks given when students reach the play area, finish their play, and return to the room.

Following the physical education period a 10 to 15 minute group listening activity may be used to help students effect a transition from the active play on the playground to the more restricted behavior in the classroom. During this time, the teacher reads a portion of a continuing story aloud.

The final period of the day is devoted to exploratory activities. The class is divided in half with one group going to a center with the teacher while the group goes to a center with the aide. Students spend from 20 to 25 minutes working at two of the four centers in the back of the room. At the end of this period the two groups either exchange centers or rotate to another center.

Each task is selected for its intriguing interest value rather than because it falls within any particular grade level curriculum. It may be recalled that the exploratory level falls below the mastery level and hence science experiments are chosen for their multisensory rather than intellectual value. Nevertheless, simple, accurate descriptions of all science experiments are given by the teachers to each group. (Figure G) Following the introduction of each day's science task, the card is filed at the center and is available for students during the interventions.

Art activities are varied and have been organized by the Santa Monica staff to include projects which allow the child self-expression. An attempt is made to keep these tasks simple so that they can be completed within a 15 minute work period. However, the children may continue them over from one day to the next. The art task cards are also filed at the art area for later reference and replication. Ideas from district guides, the "Instructor" and "Grade School Teacher" have been used. (Figure H)

Communication tasks for building social skills are introduced during the exploratory period and are also kept filed at the communication area for later usage. Since games entered into by two or more children inevitably involve a winner, those based more on chance rather than skill have proven most successful. Activities like battleship, tic-tac-toe, hangman, etc., have all been used successfully. (Figure I)

The teacher is in command of the classroom and has many resources to creatively manipulate in a constant effort to insure the success of each student.

It is unrealistic to assume that the developmental sequence of educational goals, classroom organization, check mark system, and interventions represent a fool-proof formula for success with all educationally handicapped children. The guide lines do, however, offer sound educational, psychological, and developmental principles for training more effective teachers and establishing more adequate classrooms for disturbed children than is often possible through reliance on subjective judgment, intuition, and "cafeteria" approaches.

Evaluation of the Engineered Classroom design reveals its effectiveness for 'launching' children into learning so that they are more susceptible to regular classroom instruction and indicates a carefully controlled environment with flexible task assignments, a wide variety of rewards--in other words--true individualization of instruction and guaranteeing of success--does not promote prolonged dependency on 'free loading' but effectively gets the child ready for more traditional school learning.

Behavior modification and the Engineered Classroom do not offer the panacea so desperately sought by many special educators as they seek to better teach children with learning and behavior problems, but do suggest certain innovative additions for a field accountable as never before to intervene and halt the educational deterioration of thousands of children with good learning potential in the United States today.

TABLE A

Hierarchy of Interventions to Maintain Student Role

Level	Student Interventions
1. Mastery	a. Assign student to study booth to pursue mastery work. b. Modify mastery assignment and have student continue at desk or in study booth.
2. Social	Verbally restructure expectation of student role. (e.g., respect working rights of others, accept limits of time, space, activity).
3. Exploratory	Remove mastery assignment and reassign to Exploratory Center for specific science, art, or communication activity.
4. Order	Reassign to Order Center for specific direction following tasks. (e.g., puzzle, exercise, game, work sheet)
5. Response	Remove child from classroom and assign him to a task he likes to do and can do successfully outside. (e.g., running around playground, punching punching bag, turning specific number of somersaults on lawn)
6. Attention	Remove child from classroom put on a one-to-one tutoring relationship with teacher aide and increase use of extrinsic motivators to obtain cooperation, attention, and student behavior.
	Non-student Interventions
7. Time Out	Take away work record card and explain to child he cannot earn checkmarks for a specific number of minutes which he must spend in isolation room adjacent to class.
8. Exclusion	If the child is not able to function in time-out room, immediately suspend him from class and, if possible, send him home.

FIGURE A

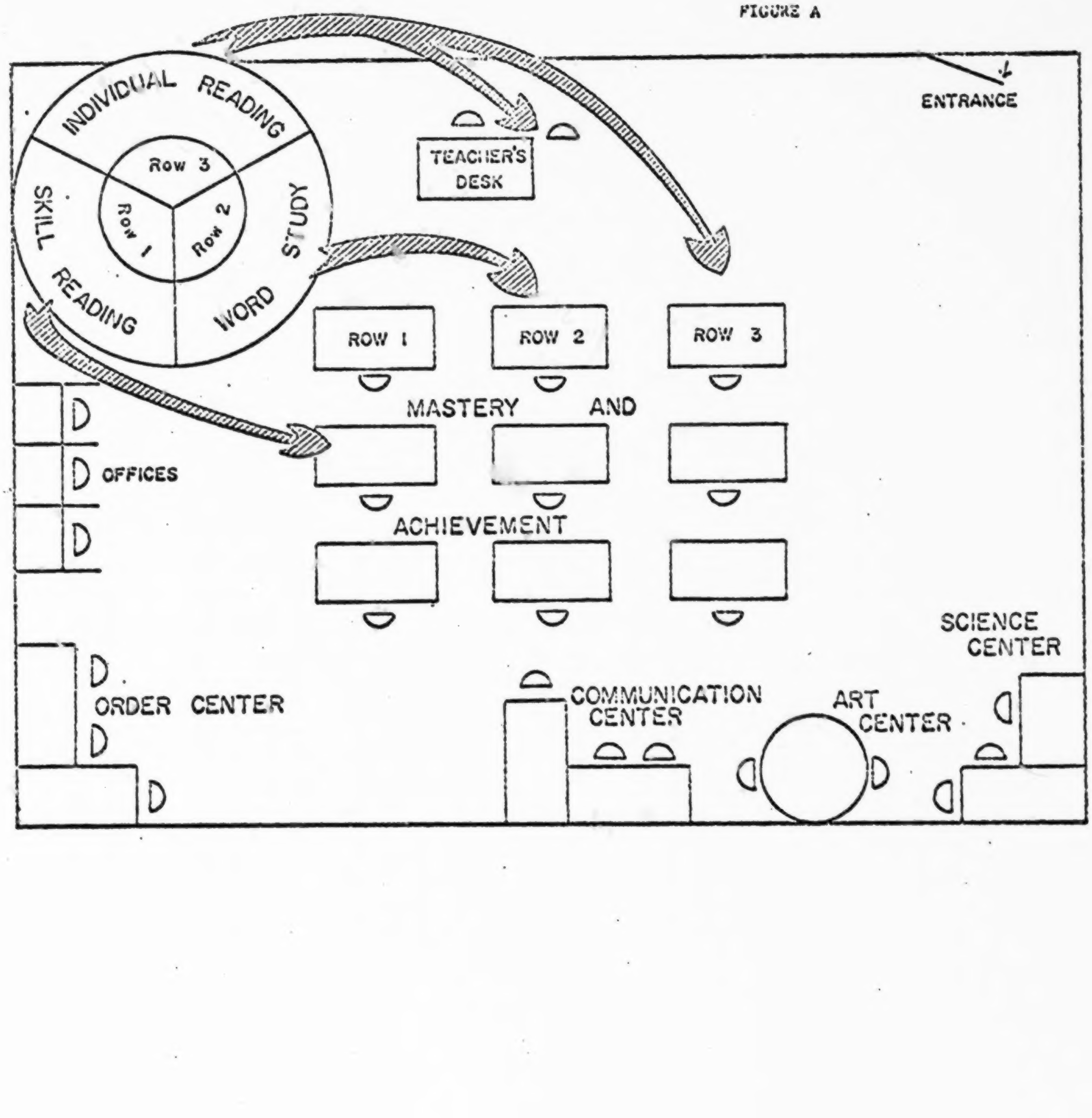

INDIVIDUAL READING
SKILL READING
WORD STUDY
Row 3
Row 1
Row 2
TEACHER'S DESK
ENTRANCE
ROW 1
ROW 2
ROW 3
MASTERY AND ACHIEVEMENT
OFFICES
ORDER CENTER
COMMUNICATION CENTER
ART CENTER
SCIENCE CENTER

FIGURE B

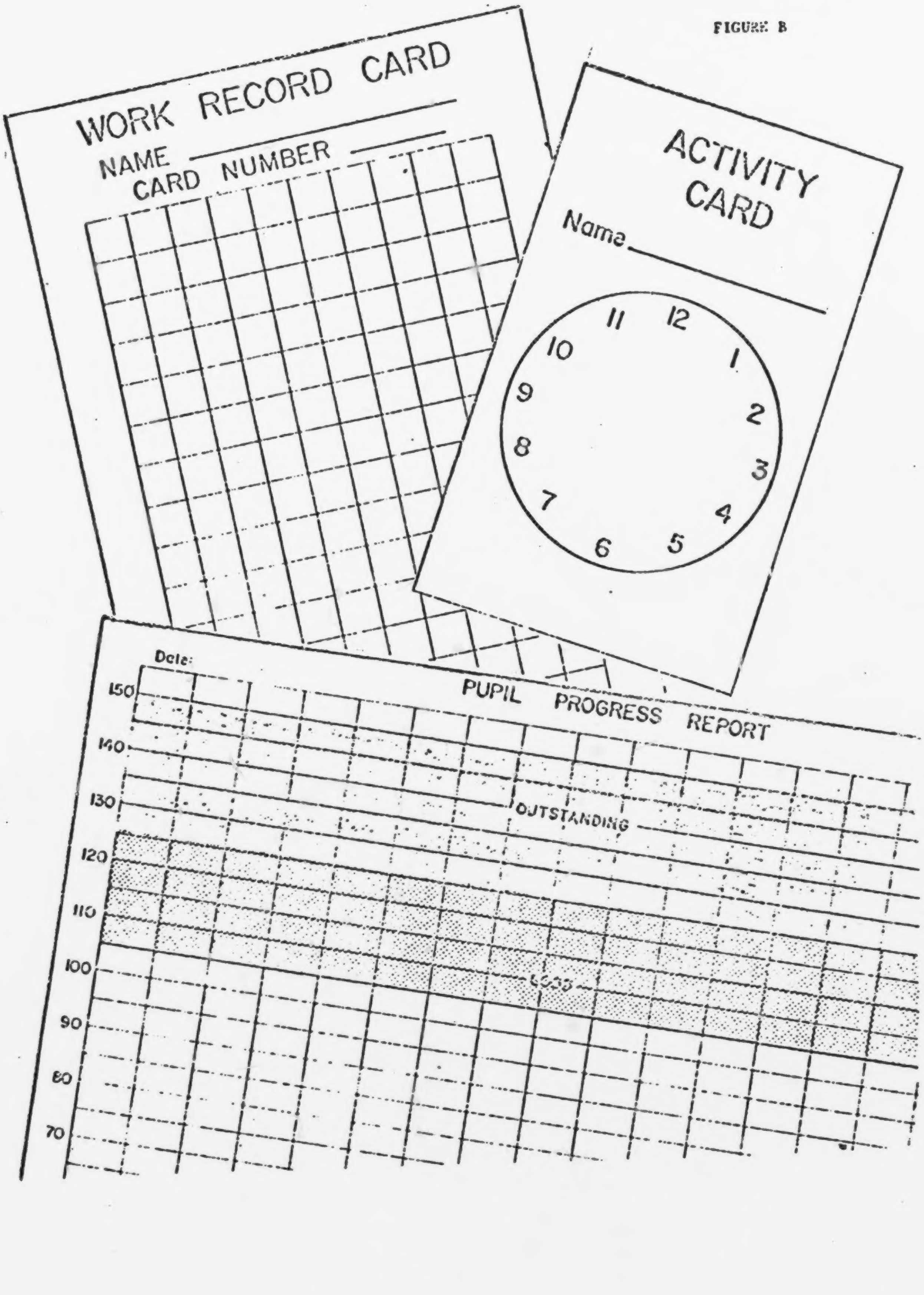
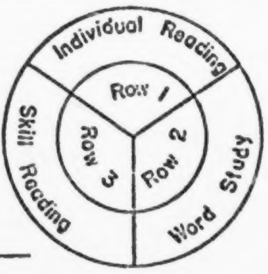

WORK RECORD CARD
NAME
CARD NUMBER
ACTIVITY CARD
Name
12
1
2
3
4
5
6
7
8
9
10
11
Date:
PUPIL PROGRESS REPORT
150
140
130
OUTSTANDING
120
110
100
GOOD
90
80
70

FIGURE C

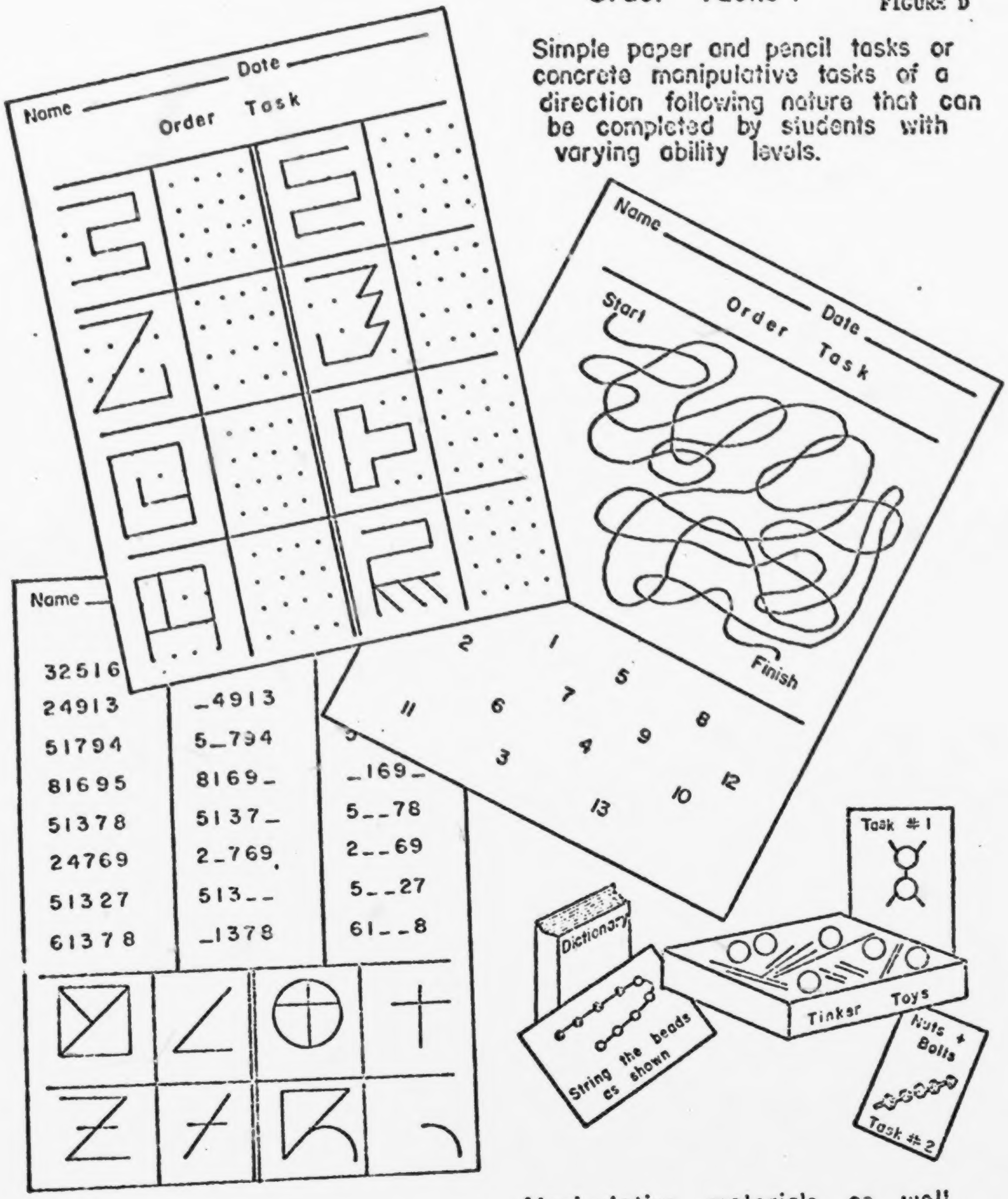
DAILY SCHEDULE

8:45	Order	Flag Salute Order Task (see Figure 3)	Checkmarks for arriving and entering Checkmarks
8:55	Reading	Individual Reading	
		Word Study (see Figure 4)	Checkmarks
		Skill Reading (see Figure 5)	Checkmarks
9:55		RECESS	Checkmarks
10:05	Arithmetic	Individual Practice in Basic Facts (see Figure 6)	Checkmarks
		Individual Arithmetic	Checkmarks
		Individual Arithmetic	Checkmarks
11:05		RECESS AND NUTRITION	Checkmarks
11:15		Physical Education	Checkmarks
11:35		Listening Time	Checkmarks
11:50	Activities	Art (Figure 7) Science (Figure 8) Communications (Figure 9) Order (Figure 3) Students are divided into two groups. One group accompanies the teacher to a center while the other group is with the aide. The groups rotate through two of the four centers utilizing 25 minute periods.	Checkmarks Activity Period Checkmarks Activity Period
12:50		STUDENT CHECKOUT	Checkmarks
12:55			



Order Tasks. FIGURE D

Simple paper and pencil tasks or concrete manipulative tasks of a direction following nature that can be completed by students with varying ability levels.

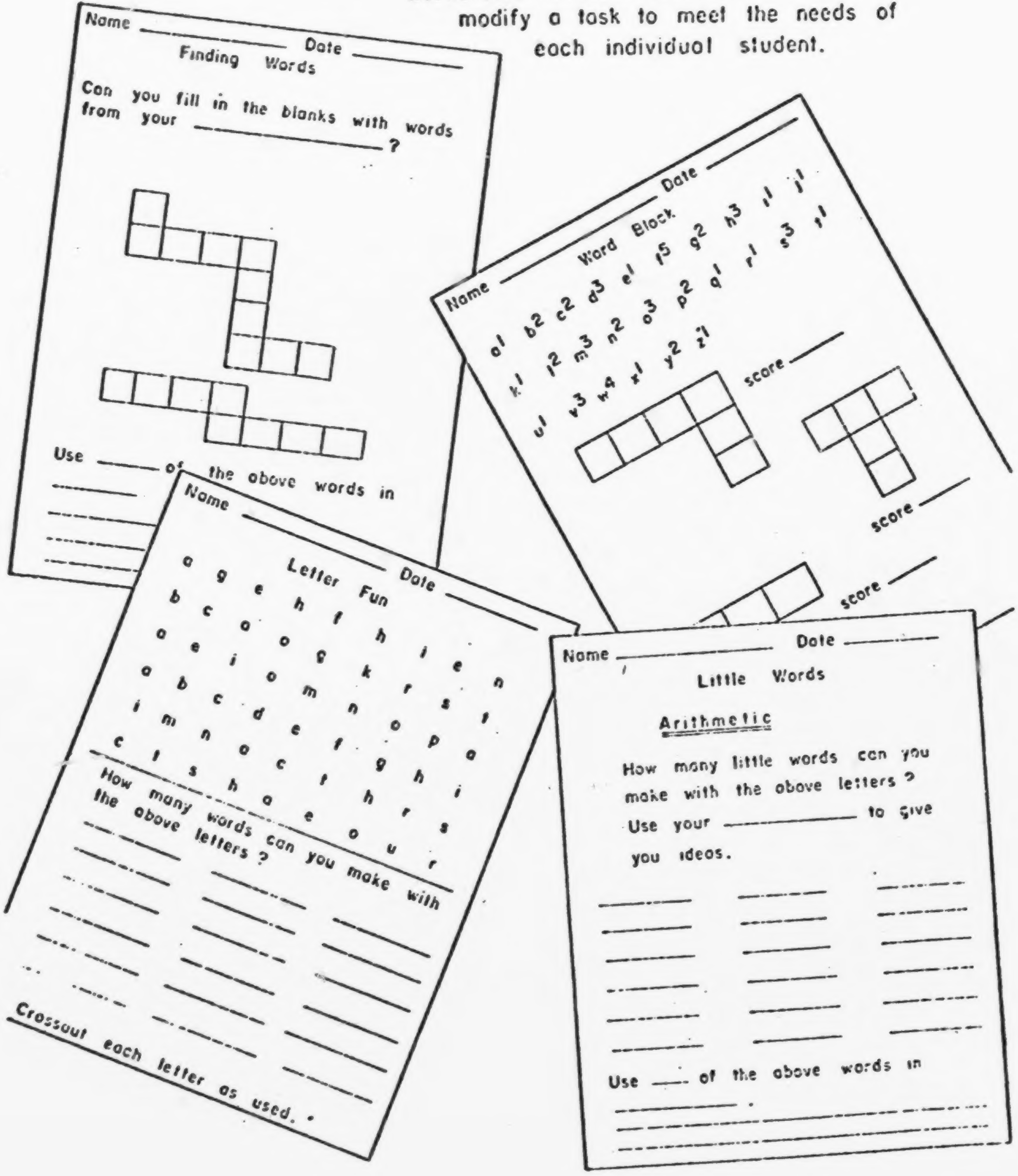

Name
Date
Order Task
Start
Finish
2 1 5 11 6 7 8 3 4 9 13 10 12
32516
24913
51794
81695
51378
24769
51327
61378
_4913
5_794
8169_
5137_
2_769
513__
_1378
_169_
5__78
2__69
5__27
61__8
Dictionary
String the beads as shown
Tinker Toys
Task #1
Nuts + Bolts
Task #2

Manipulative materials as well as specific academic direction following tasks are utilized during the Order activities scheduled the last hour of the day.

Skill Reading Tasks

FIGURE E

Multi-level tasks differ from regular worksheets because teachers can easily modify a task to meet the needs of each individual student.



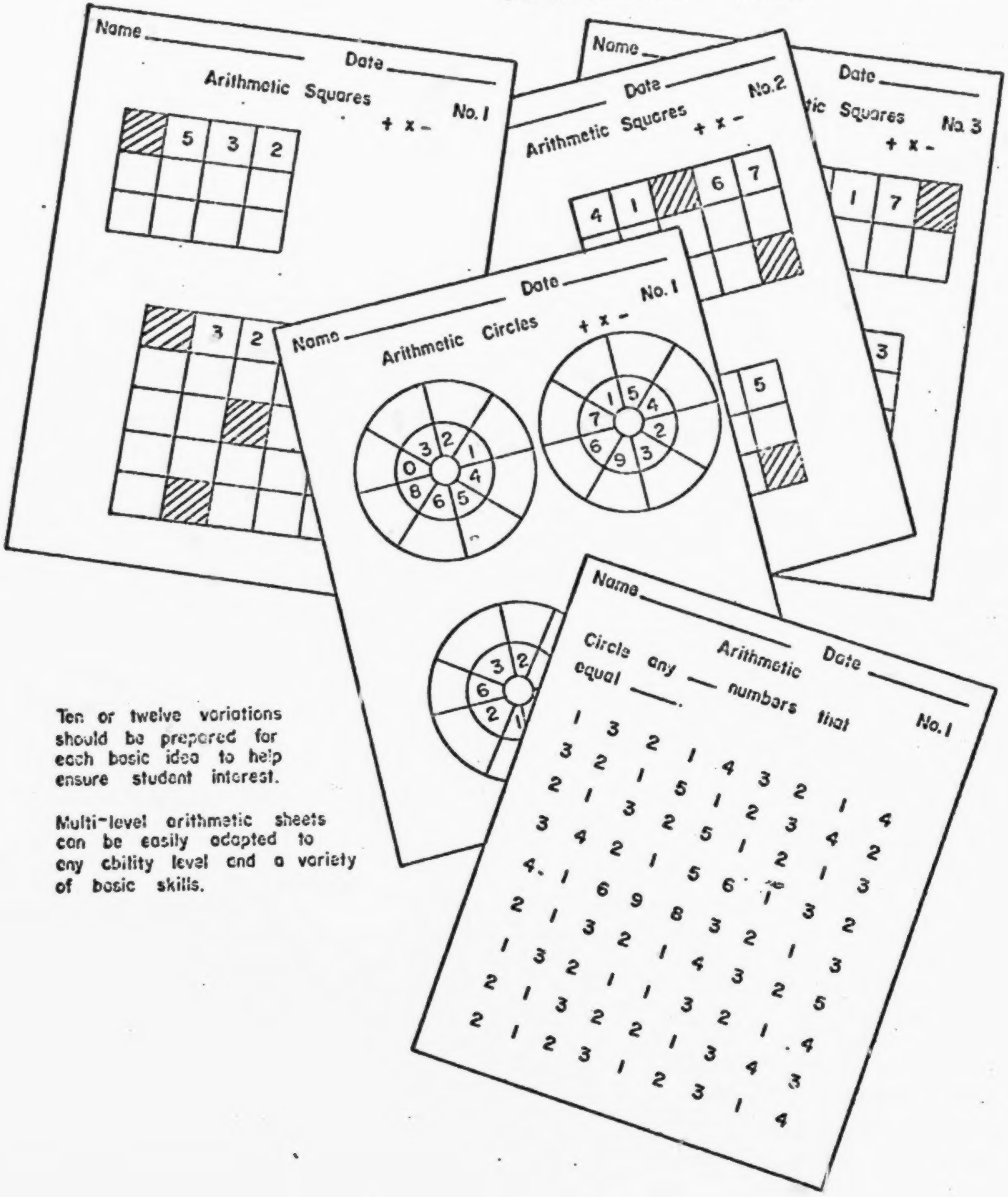
Name ____ Date ____
Finding Words
Can you fill in the blanks with words from your ________ ?
Use ___ of the above words in

Name ____ Word Block ____ Date ____
a^1 b^2 c^2 d^3 e^1 f^5 g^2 h^3 i^1 j^1
k^1 l^2 m^3 n^2 o^3 p^2 q^1 r^1 s^3 t^1
u^1 v^3 w^4 x^1 y^2 z^1
score ____
score ____
score ____

Name ____ Date ____
Letter Fun
a g e h f h i e n
b c o o g k r s t
a e i o m n o p a
a b c d e f g h i
i m n o c t h r s
c l s h a e o u r
How many words can you make with the above letters ?
Crossout each letter as used.

Name ____ Date ____
Little Words
Arithmetic
How many little words can you make with the above letters ?
Use your ________ to give you ideas.
Use ___ of the above words in

Arithmetic Tasks FIGURE F


Name
Date
Arithmetic Squares
No. 1
+ x -
5 3 2
3 2
Arithmetic Squares
No. 2
4 1 6 7
Arithmetic Squares
No. 3
1 7
3
5
Arithmetic Circles
No. 1
3 2 1 4 5 6 8 0
1 5 4 2 3 9 6 7
3 2 6 2 1
Arithmetic
Circle any ___ numbers that equal ___.
No. 1
1 3 2 1 4 3 2
3 2 1 5 1 2 3 2 1 4
2 1 3 2 5 1 2 3 4 2
3 4 2 1 5 6 1 1 3
4 1 6 9 8 3 2 3 2
2 1 3 2 1 4 3 2 1 3
1 3 2 1 1 3 2 2 5
2 1 3 2 2 1 3 1 4
2 1 2 3 1 2 3 4 3
1 4

Ten or twelve variations should be prepared for each basic idea to help ensure student interest.

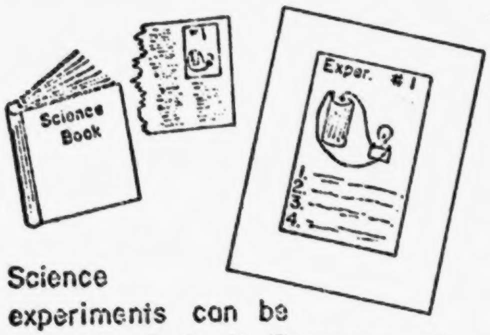
Multi-level arithmetic sheets can be easily adapted to any ability level and a variety of basic skills.

EXPLORATORY TASK

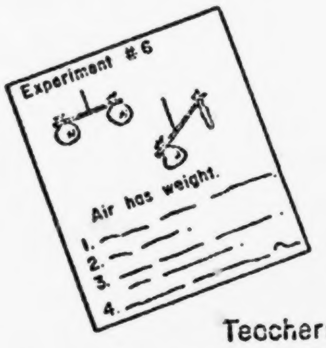
EXPLORING OUR ENVIRONMENT

FIGURE G

Tasks are selected for their multisensory rather than intellectual value. Each task uses concrete manipulative materials in a situation with a predictable outcome that provides the student with an opportunity to explore his environment.



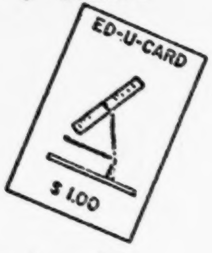
Science experiments can be cut out of Scott, Foresman or other science series and then mounted on cards.



Teachers can collect science ideas from many sources and prepare cards with appropriate science tasks.

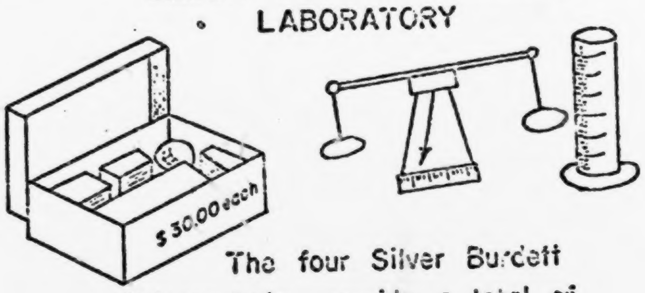
Many fine commercial materials and ideas are available.

ED-U-CARDS



Sets of Science cards with experiments are inexpensive and available.

SILVER BURDETT SCIENCE LABORATORY

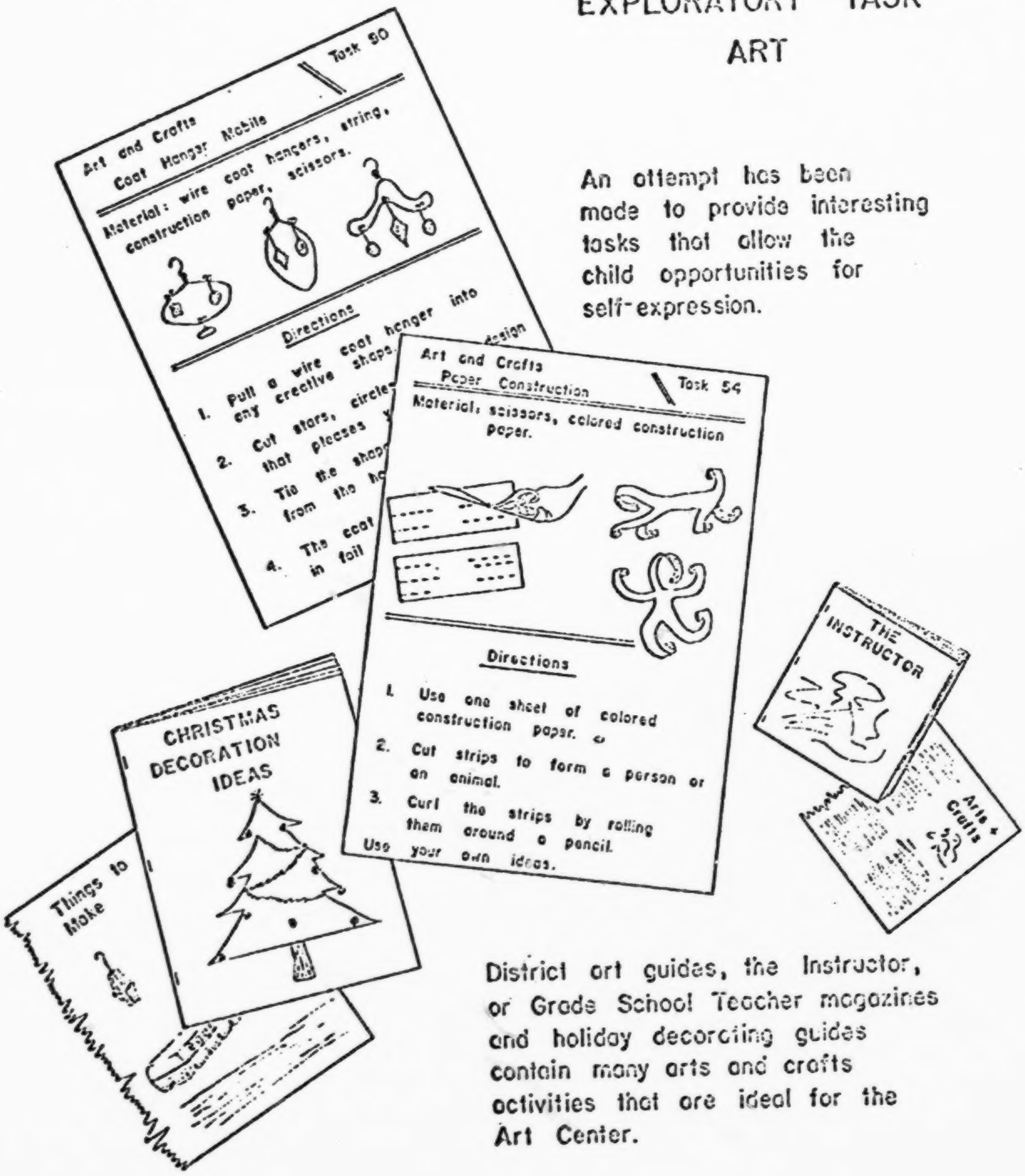


The four Silver Burdett Science Labs provide a total of more than 150 experiments and are ideal for the science area.

FIGURE II

EXPLORATORY TASK
ART

An attempt has been made to provide interesting tasks that allow the child opportunities for self-expression.



Art and Crafts
Coat Hanger Mobile
Task 50

Material: wire coat hangers, string, construction paper, scissors.

Directions

1. Pull a wire coat hanger into any creative shape ... design
2. Cut stars, circle ... that pleases y
3. Tie the shap ... from the h
4. The coat ... in foil

Art and Crafts
Paper Construction
Task 54

Material: scissors, colored construction paper.

Directions

1. Use one sheet of colored construction paper.
2. Cut strips to form a person or an animal.
3. Curl the strips by rolling them around a pencil.

Use your own ideas.

District art guides, the Instructor, or Grade School Teacher magazines and holiday decorating guides contain many arts and crafts activities that are ideal for the Art Center.

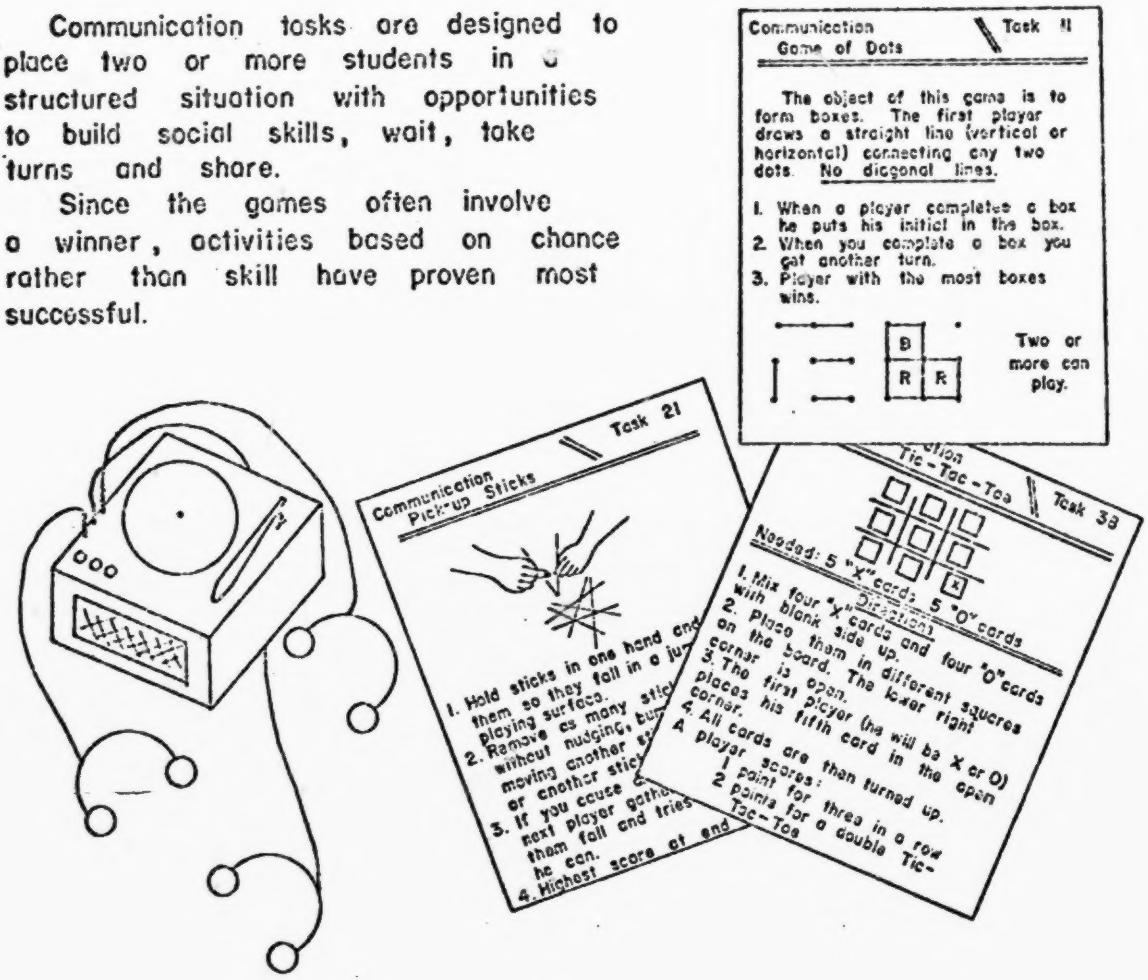
FIGURE I

EXPLORATORY TASK

COMMUNICATION

Communication tasks are designed to place two or more students in a structured situation with opportunities to build social skills, wait, take turns and share.

Since the games often involve a winner, activities based on chance rather than skill have proven most successful.



Communication
Game of Dots
Task 11

The object of this game is to form boxes. The first player draws a straight line (vertical or horizontal) connecting any two dots. No diagonal lines.

1. When a player completes a box he puts his initial in the box.
2. When you complete a box you get another turn.
3. Player with the most boxes wins.

Two or more can play.

Communication
Pick-up Sticks
Task 21

1. Hold sticks in one hand and
them so they fall in a ju
playing surface.
2. Remove as many stic
without nudging, bu
moving another s
or another stic
3. If you cause
next player gath
them fall and tries
he can.
4. Highest score at end

Tic-Tac-Toe
Task 38

Needed: 5 "X" cards 5 "O" cards

Directions

1. Mix four "X" cards and four "O" cards with blank side up.
2. Place them in different squares on the board. The lower right corner is open.
3. The first player (he will be X or O) places his fifth card in the open corner.
4. All cards are then turned up.

A player scores:
1 point for three in a row
2 points for a double Tic-Tac-Toe

Ideas for Communication Tasks can be obtained from children's paper and pencil game books; adapting simple card games or modifying commercial puzzles and activities.

APPENDIX II

SANTA MONICA UNIFIED SCHOOL DISTRICT

BEHAVIOR PROBLEM CHECKLIST

(Courtesy of University of Illinois Children's Research Center)

Copyright: Herbert C. Quay and Donald R. Peterson 1967

Please complete each question carefully.

Name of Child______________________________

Name of Teacher______________________________

Please indicate which of the following constitute problems, as far as this child is concerned. If an item does not constitute a problem, encircle the zero: if an item constitutes a mild problem, encircle the one; if an item constitutes a severe problem, encircle the two. Please complete every item.

0 1 2 1. Restlessness, inability to sit still
0 1 2 2. Attention-seeking, "show-off" behavior
0 1 2 3. Stays out late at night
0 1 2 4. Doesn't know how to have fun; behaves like a little adult.
0 1 2 5. Self-consciousness; easily embarrassed
0 1 2 6. Fixed expression, lack of emotional reactivity
0 1 2 7. Disruptiveness; tendency to annoy and bother others
0 1 2 8. Feelings of inferiority
0 1 2 9. Steals in company of others
0 1 2 10. Boisterousness, rowdiness
0 1 2 11. Crying over minor annoyances and hurts
0 1 2 12. Preoccupation; "in a world of his own"
0 1 2 13. Shyness, bashfulness
0 1 2 14. Social withdrawal, preference for solitary activities
0 1 2 15. Dislike for school
0 1 2 16. Jealousy over attention paid other children
0 1 2 17. Belongs to a gang
0 1 2 18. Repetitive speech
0 1 2 19. Short attention span
0 1 2 20. Lack of self-confidence
0 1 2 21. Inattentiveness to what others say
0 1 2 22. Easily flustered and confused
0 1 2 23. Incoherent speech
0 1 2 24. Fighting
0 1 2 25. Loyal to delinquent friends
0 1 2 26. Temper tantrums
0 1 2 27. Reticence, secretiveness
0 1 2 28. Truancy from school
0 1 2 29. Hypersensitivity; feelings easily hurt
0 1 2 30. Laziness in school and in performance of other tasks

0 1 2 31. Anxiety, chronic general fearfulness
0 1 2 32. Irresponsibility, undependability
0 1 2 33. Excessive daydreaming
0 1 2 34. Has bad companions
0 1 2 35. Tension, inability to relax
0 1 2 36. Disobedience, difficulty in disciplinary control
0 1 2 37. Depression, chronic sadness
0 1 2 38. Uncooperativeness in group situations
0 1 2 39. Aloofness, social reserve
0 1 2 40. Passivity, suggestibility; easily led by others
0 1 2 41. Clumsiness, awkwardness, poor muscular coordination
0 1 2 42. Hyperactivity; "always on the go"
0 1 2 43. Distractibility
0 1 2 44. Distructiveness in regard to his own and/or others property.
0 1 2 45. Negativism, tendency to do the opposite of what is required
0 1 2 46. Impertinence, sauciness
0 1 2 47. Sluggishness, lethargy
0 1 2 48. Drowsiness
0 1 2 49. Profane language, swearing, cursing
0 1 2 50. Nervousness, jitteriness, jumpiness, easily startled
0 1 2 51. Irritability; hot-tempered, easily aroused to anger.
0 1 2 52. Often has physical complaints, e.g. headaches, stomach ache

APPENDIX III

DEVIANT CLASSROOM BEHAVIOR FREQUENCY COUNT--INSTRUCTIONS

UNIVERSITY OF ILLINOIS - CHILDREN'S RESEARCH CENTER

BY QUAY & WERRY

Classroom Situation for Observing

Observing should be done in a task situation where the rules are clearly defined. In general, this will be during individual, academic seat work. Activities such as story-time and most group situations generally prove unsuitable because rules tend to be relaxed and unclear. Observations should not be done when there is a prolonged period of individual instructions during which the teacher is seated beside the child since this tends artificially to minimize deviant behavior.

Observing Procedure

The observer must seat himself close enough to the child to be able to hear what the latter is saying and to see what he is doing on his desk.

Observe the child (one at a time) for twenty seconds and than rest for ten seconds during which the appropriate symbols can be entered in the cells of the score sheet. Behaviors occurring during this ten second period are never recorded. Thus there are two observations per minute. Presently there are thirty separate cells of observation, thus taking a total observing time of fifteen minutes. Timing must be exact. There is no objection to splitting the observation (i.e. part before recess and part after recess).

Definitions of Observations

There are three classes of observations: 1) deviant behavior, 2) on task behavior, and 3) teacher contact.

1) Deviant behavior (scored above the line). This is defined as any behavior which contravenes any explicit or implicit rule under which the class or individual child operates. Therefore, it is imperative to determine what the rules are in a given classroom before undertaking any observations. The observer should question the teacher particularly about conditions under which it is permissible for a child to leave his seat and to speak.

When there is any doubt about a particular behavior, mark it non-deviant.

Only one symbol of a given type should appear in a cell though it is permissible to have as many different symbols in the one cell as necessary. Thus $\boxed{X\_V}$ is all right, but $\boxed{X\_X}$ is not. It is helpful to record the deviant behaviors as they occur rather than waiting for the end of the observation period to write these down. If the on-task item (vide infra.) is left for the ten second "off" period there will be little danger of getting cells muddled.

Symbol	Description
X	Out of chair

This is defined as any situation in which the normal seating surface of neither buttock is applied to the child's seat or in which there is movement of his desk or chair so that its ultimate stationary position is altered (thus swinging a seat on its axis or tilting a chair on its legs is excluded.) Where the child is performing a permitted out-of-seat activity such as sharpening his pencil (after having gotten permission from the teacher) this would not be marked as out-of-seat behavior except (1) when deviant behavior occurs during the permitted act such as "side trips," looking at things on the teacher's desk, stopping to talk, etc. or (2) when the permitted activity is prolonged beyond a reasonable period of time or altered in some significant way.

→ Physical Contact or Disturbing Others Directly

Any physical contact initiated or reciprocated between the child under observations and another person independent of the intent of the child (aggression of affection). Include here physical contact made with another person by means of an object such as a book held in a hand or an object thrown, or some disturbance of another person or child by the subject in which there is contact not with the other's body but rather with objects about him such as his work, his desk, etc. Examples: grabbing objects or work, knocking objects off the other's desk, destroying his property or pushing his desk.

N Audible Noise

Any non-vocal, non-respiratory noise which is clearly audible, and which is not an integral part of a non-deviant activity. Examples: tapping a pencil, clapping, tapping feet, rattling or tearing papers, throwing a book on a desk, slamming a desk closed, etc.

↷ 90° Turn, Seated

A child must be seated and the turn of head and/or body must be more than 89°. The desk is used as a reference point. Exception is where the child wishes to attract the teacher's attention and turns, raising his hand to attract attention. A helpful guide here is if the head is parallel to the shoulders, or if the child or the other person looked at is beyond the 90 degree arc, the turn must be in excess of 89 degrees.

V Vocalization

A vocalization or other non-physiological (that is, normal cough or sneeze) respiratory noise such as a whistle which is not task-related. Examples are answering teacher without first raising hand, talking to others without permission, muttering, which is obviously intended for an audience, swearing, etc. Do not rate as V behavior that which is a direct response to a teacher's question or, in general, when a teacher is with the child except where the content of what is said is clearly deviant, such as stating refusal to do work, putting off obeying instructions, swearing, etc. Do not include working out loud.

I Isolation (i.e. for deviant behavior)

The child has been sent out of the room as a punishment or has been placed in the time-out room. The appropriate below the line (that is, on-task--off-task symbol in such cases is //; other deviant behaviors which can be noted such as vocalizations, noises, should be recorded along with the I.

0 Other Deviant Behavior

Include here behaviors which do not fit easily into a category above and also behaviors which are situational rather than absolutely deviant. For example, engaging in a task other than that which is assigned (reading, instead of doing arithmetic, drawing instead of reading, etc.). Include here also daydreaming. Exceptions: the following are not deviant behaviors: playing with clothes, playing with self, chewing gum, playing with pencil in hand (all other pencil activities such as propping desk up with a pencil or taking a ball-point pencil to pieces, stubbing the point heavily on wood, etc. are deviant).

2) On task--off-task activity (scored below line).
Definition -- This is an attempt to assess the child's attention to this designated task material. Attending is defined as the eyes being applied to the task material or to the teacher for a period of not less than 15 out of the 20 seconds of observation (use your stop watch!). Exceptions to this are where the child can be clearly seen to be on task even though his eyes are off his work, for example by counting on his fingers, working out loud, etc. It should be noted that while it is possible for deviant behavior -- particularly disruptive noises such as tapping the foot or deviant behaviors of short duration (less than five seconds) -- to be recorded and yet the child may still get on "on..task" check, the converse, namely being off

task without some deviant behavior being noted above the line cannot occur. In general when in doubt put a 0 above the line.

//	Actively engaged in some other activity which is either clearly deviant or not the assigned for greater than five seconds.

Sometimes this will become apparent only after some time has elapsed as for example when the teacher comes up and admonishes the child for doing other than that which is assigned. In such circumstances the incorrect cell should then be corrected.

D	Daydreaming -- here the child is off task for more than five seconds but does so by daydreaming, staring into space rather than some active endeavor.

This type of behavior is very uncommon in conduct problem children.

3) Teacher contact (scored below the line). Teacher is defined as any person who is interacting with the children rather than just observing them. This would, therefore, include teachers, teacher assistants, staff of the Children's Research Center who are actively assisting with discipline, recreation specialists, etc. Any contact between teacher and child whether initiated by child or by teacher is scored here. This would include such obvious contacts as talking to the child but also less obvious ones such as gesturing or turning the child's clock on or off. It is permissible to have only one teacher contact noted in a cell.

T	Teacher initiated contact (no instigation on part of child)
C	Child initiated contact (include both questions, etc.) And teacher responding to deviant behavior.
T & C	Positive contact (judged by what teacher does)
$\cancel{T}$ & $\cancel{C}$	Negative contact (Note: $\cancel{T}$ ought not to occur!)

STUDENT BEHAVIOR FREQUENCY COUNT

Teacher ____________________

Student ____________________

Date ________________ Time __________

Subject ____________________

Observer ____________________

—	
X	
→	
N	
↷	
V	
I	
Φ	

—	
//	
T	
C	
T̸	
C̸	

APPENDIX IV

DISSEMINATION OF THE ENGINEERED CLASSROOM DESIGN DURING PHASE TWO OF THE SANTA MONICA PROJECT

Papers and presentations were made by one or more of the authors during 1968 and 1969 at conferences, seminars, and workshops throughout the country. A representative list follows:

American Academy of Pediatrics Conference	University of Oregon Eugene, Oregon
Culver City Association Childhood Education	Culver City, California
South Bay Pediatric Society	Redondo Beach, California
Arizona Department of Public Instruction	Phoenix, Arizona
American Orthopsychiatric Association	Chicago, Illinois
National Council for Exceptional Children	New York City, New York
National Council for Exceptional Children	Denver, Colorado
Los Angeles County Society for Child Psychiatry	Lake Arrowhead, California
California State Council for Exceptional Children	San Francisco, California
Canadian Association for Children with Learning Disabilities	Toronto, Canada
National Society for Crippled Children and Adults	Boston, Massachusetts
Hawaiian Association of Children with Learning Disabilities	Honolulu, Hawaii
Dade County Guidance Association	Miami, Florida
Greater Edmonton Teacher's Convention	Edmonton, Alberta, Canada

New Jersey Association for Children with Learning Disabilities	New Brunswick, New Jersey
Connecticut State Department of Education Workshop	Hartford, Connecticut
Florida State CEC	Orlando, Florida
Title VI Workshop - Northern California	Shasta, California
El Monte City Schools	El Monte, California
St. Louis University	St. Louis, Missouri
San Diego State College	San Diego, California
University of Miami	Miami, Florida
Temple University	Philadelphia, Pennsylvania
Michigan Student CEC - Eastern Michigan University	Ypsilanti, Michigan
Rhode Island College	Providence, Rhode Island
University of Idaho	Moscow, Idaho
National City Schools	National City, California
Arcadia Schools	Arcadia, California
Nebraska State Department of Education	Lincoln, Nebraska
University of California at Riverside	Riverside, California
Los Angeles State College	Los Angeles, California
University of Southern California	Los Angeles, California
La Mesa/Spring Valley Schools	La Mesa, California
Moreno Valley Schools	Sunnymead, California

During 1968-69, hundreds of visitors including teachers, administrators, psychologists, professors, and graduate students were given orientation and classroom visits by the Santa Monica Project staff. A representative list of organizations is included. The groups were not limited and often consisted of as many as 10 to 12 visitors at a time.

Biola College	Los Angeles, California
Los Angeles City Psychologists	Los Angeles, California
Barstow School District	Barstow, California
Long Beach State College	Long Beach, California
Pasadena City Schools	Pasadena, California
Pepperdine College	Los Angeles, California
Rio Hondo School District	Rio Hondo, California
Escondido Schools	Escondido, California
Folsom School District	Folsom, California
La Mesa/Spring Valley School	La Mesa, California
University of Wisconsin	Madison, Wisconsin
Penn State	Bellefont, Pennsylvania
Palo Alto Schools	Palo Alto, California
Timber School District	Timber, California
South Downey Junior High	Downey, California
Marymount College	Los Angeles, California
Riverside Schools	Riverside, California
Thousand Oaks Schools	Thousand Oaks, California
Wiseburn Schools	Wiseburn, California
University of Missouri	Columbia, Missouri
Cypress Schools	Cypress, California
N.P.I. Staff, UCLA	Los Angeles, California

Torrance Schools	Torrance, California
Burbank Schools	Burbank, California
Edmonton Schools	Edmonton, Alberta, Canada
Moscow Schools	Moscow, Idaho
Culver City Schools	Culver City, California
Riverside School for Deaf	Riverside, California
Temple University	Philadelphia, Pennsylvania
University of Southern California	Los Angeles, California
University of Miami	Miami, Florida
Elk Grove Schools	Elk Grove, Illinois
El Rancho Schools	El Rancho, California
Big Bear Schools	Big Bear, California
Long Beach Schools	Long Beach, California
Ojai Schools	Ojai, California
Santa Ana Schools	Santa Ana, California
Provo Schools	Provo, Utah
Hartford Schools	Hartford, Connecticut
Colorado University	Denver, Colorado
Las Vegas Schools	Las Vegas, Nevada
Hemit Schools	Hemit, California
Moreno Valley Schools	Moreno Valley, California
Oakhurst Schools	Oakhurst, California
Monterey Schools	Monterey California
Oxnard Schools	Oxnard, California
San Francisco State College	San Francisco, California
U.C.L.A. Graduate Students	Los Angeles, California

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BUREAU OF EDUCATION FOR THE HANDICAPPED
DIVISION OF RESEARCH

PROJECT NUMBER: 7-1298 FINAL REPORT

TITLE: Demonstration and Evaluation of an Engineered Classroom Design for Emotionally Disturbed Children in the Public School. Phase II: Primary and Secondary Level

INVESTIGATOR: Frank M. Hewett

INSTITUTION: The University of California
Los Angeles, California

DURATION: 19 months

FEDERAL FUNDS: $104,000.00

BUDGET CATEGORY: Demonstration Project

PROJECT OFFICER: Melville J. Appell

REVIEW PROCEDURE: Field Review

RECOMMENDATION: Approval

CERTIFICATION:

____________________ Project Officer	____________ Date
____________________ Branch Chief	____________ Date
____________________ Division Research	____________ Date
____________________ Associate Commissioner	____________ Date

SUMMARY OF REVIEWS

This is the final report of Phase II of the Engineered Classroom. The Phase extended Hewett's early work to the secondary level and also developed procedures for integration of students back into regular classrooms.

Consistency

The final report indicates objectives and procedures were consistent with those set down in the approved proposal. As indicated in the proposal three groups, total 90 subjects were matched for IQ, age, grade placement, and sex. These groups were the Engineered Classroom Group:

Control Group I consisting of educationally handicapped students and Control Group II consisting of normal children.

Technical Soundness

The proposal was soundly designed, conceived, and executed in accordance with the original proposal.

The authors have taken the necessary precautions concerning generalizations (because of a restricted sample) and "unfinished business." On page 50, they indicate the need for further investigation to find out whether academic deficits can be made up in regular class once the child's behavior becomes tolerable or whether special class is necessary. Complete data tables showing means and variances for important variables are provided and interpreted.

Dr. Whelan's comment that only 50 percent were returned to regular class appear to deny the statement on page 25. Of the 37 located in Phase II, 35 were in regular class.

Some questions remain (1) Table of statistical tests are intermingled with tables of raw data (pages 31 and 17). Raw data is given for Phase I and statistical test for Phase II. Why not make them compatible? At present this implies confusion between Phase I and II; (2) Aren't conclusions somewhat descriptive?

Educational Significance

Significant questions and answers for this study are posed on page 48 and following pages.

Reviewers find that this and previous projects have "Wide support all across educational circles . . ." The report is of the highest technical quality with all material essential to understanding, adequately presented.

In general, the report discusses the relevant topics in an acceptable manner. A sound demonstration project concerned with improvement of learning and classroom behavior for EH children has been produced. The project extends to the classroom years of experimental work.

While some awkardness in wording and at least one inappropriate word still exists, the report is eminently readable and illustrative of sound research demonstration in special education. It is recommended for approval.